AIR MOBILITY COMMAND'S EN ROUTE SUPPORT INFRASTRUCTURE: A CONSTRUCT OF AIRCRAFT TYPE AND GEOGRAPHIC LOCATION UTILIZED TO ASSESS EN ROUTE AIRCRAFT LOGISTIC SUPPORT

THESIS

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Abstract

The ability of the United States Armed Forces to maintain a global presence and rapidly project military power anywhere in the world are key factors in preserving our freedom. To accomplish the demanding task of global reach support, Air Mobility Command employs an en route support infrastructure. These en route locations provide varying levels of command, control, and communications (C^3), logistics support, and aerial port functions. The goal of the en route is to minimize delays for AMC mission aircraft. However, these en route locations comprise a small percentage of the locations that AMC aircraft visit. Given the critical demand for rapid air mobility, potential impact of mission delays or cancellations, and the substantial investment of taxpayer dollars, AMC must provide logistical support to off-station aircraft in the most effective manner possible.

This research examined a 5-year historical summary of AMC's logistical support process. The resulting data was used to perform a statistical analysis of AMC off-station aircraft logistic support records for AMC's six primary aircraft fleets (C-5, C-17, C-141, C-130, KC-10, & KC-135). The calculated average not mission capable (NMC) time was used to compare overseas en route and non en route locations to assess AMC's en route infrastructure's effectiveness in reducing mission delays due to aircraft maintenance problems. Effectiveness, in the context of this research, was measured in terms of a lower or shorter average NMC time, equating to reduced mission delays.

The initial data analysis on OCONUS en route and non en route locations provided a macro level assessment based on location only. A closer investigation on

each of the six primary AMC aircraft fleets returned varying results in terms of reduced averaged NMC time. To determine if a significant difference existed between data groups, parametric and nonparametric statistical testing methods were used. All data groups were tested for normal distributions using histograms and goodness-of-fit tests. Each of the data set had non-normal or non-lognormal distribution and unequal variances based on F-test results. Mann-Whitney (Wilcoxon) tests were used to determine significant differences between the ranked sums and unpaired two-sample Student's t-tests assuming unequal variances were also applied to test for differences in population means.

The results of this study indicate that the OCONUS en route infrastructure is effective in reducing average NMC time as compared to OCONUS non en route locations, except in the case of the KC-135 fleet. Overall, en route locations appear to reduce average NMC time by more than 17 hours. Results of the aircraft fleet comparisons reveal significant reductions in NMC time for the C-5, C-17, C-141, and KC-10 fleets. The C-130 fleet appeared to achieve a slight reduction in average NMC time. In the case of the KC-135, the en route average NMC time was nearly one hour higher than non en route locations. The findings of this study could be further evaluated by the suggested future research topics.

Dedication

To my Mom and Dad for their constant support

To my daughters for making my life so wonderful!

To my one special friend, you are just what I needed!

Acknowledgments

I would like to express my sincere appreciation to the following people: To my research advisor, Maj Sharon Heilmann, for offering her leadership when I needed to change advisors. To Lt Col Summer Bartczak for her continued guidance, patience, and understanding and to Maj Sonia Leach for her support as thesis committee member. To Lt Col (Ret.) Stephen Swartz for getting this research started and Gary Thomas at Air Mobility Command Headquarters for his assistance in collecting the data used in this study. Additionally, my gratitude goes out to Col James Weber (HQ AMC/A49) for providing sponsorship for this research.

Due to the extraordinary circumstances involved with the completion of this thesis, I also extend my heartfelt thanks to Lt Col Bob Boone, Maj Steve Anderson and family, Capt Bob Lyons, and Mark Williams. When it could have been easier to quit, your motivation, encouragement, and inspiration pushed me through. To my special friend, thank you for being everything at all times…you are truly amazing!

Thank you to my daughters, who endured my absence throughout most of my Air Force career, for always giving me your support while asking nothing in return. To my daughter, I could not have completed my time at AFIT without you. Your unwavering support allowed me to be a single parent, a student, and a senior NCO all at the same time. To my other daughter, for always bringing a smile to my face and making every break from my studies truly enjoyable. Words cannot truly express how fortunate I feel to have you both in my life. *Vous êtes la lumière de ma vie!*

Robert D. Polomsky

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Introduction

Background

Since 1990, terms like "Global Reach", "Global Engagement", and "Global Power" have been used to describe the United States' unprecedented ability to project combat power and humanitarian aid quickly to any point on the globe. All of these terms describe concepts that are embodied in the global reach laydown strategy (Air Force Doctrine Center (AFDC), 1999a) and rely heavily upon a single Air Force core competency, rapid air mobility (AFDC, 1999d). Rapid air mobility has been called the "backbone of deterrence" and has come to the forefront of military strategy in recent years along with an increased demand for airlift and air refueling missions (Hutcheson, 1999).

Another indication of the emphasis placed on the global reach strategy is the $111 million in funding provided just to the European en routes in fiscal year 2003 (FY03) (721st Air Mobility Operations Group (AMOG), 2003). As the single fiscal manager for all Department of Defense (DoD) transportation, United States Transportation Command (USTRANSCOM) allocates this funding and tasks Air Mobility Command (AMC) with primary responsibility for providing airlift, air refueling, air mobility support, special air mission, and aeromedical evacuation forces (Air Mobility Command (AMC), 2006; AFDC, 1999a). Given the critical demand for rapid air mobility, potential impact of mission delays or cancellations, and the substantial investment of taxpayer dollars, AMC must provide logistical support to off-station aircraft in the most effective manner possible.

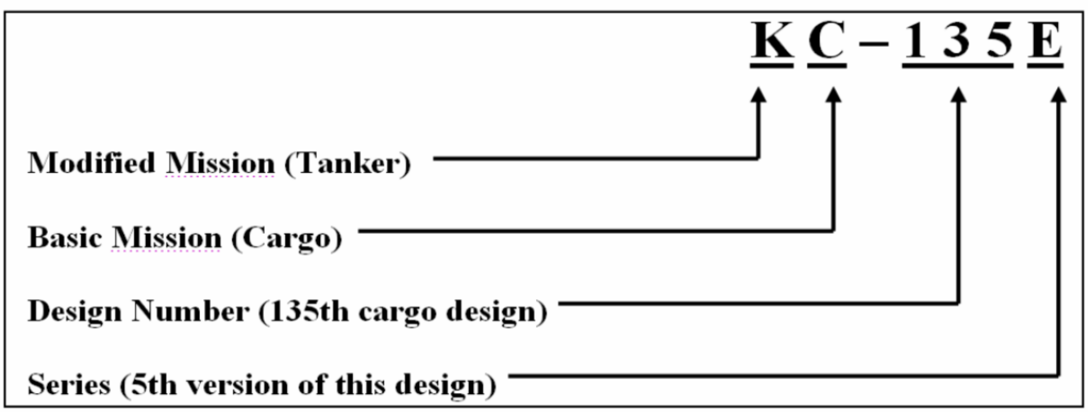
To accomplish the complex task of off-station air mobility support, AMC employs an en route support infrastructure. This concept of support may include many functions, but all en route locations provide three basic roles, to include: (a) command, control, and communications (C^3), (b) aircraft maintenance; and (c) aerial port (United States Joint Forces Command (USJFCOM), 2002). A primary purpose of the en route system is to minimize aircraft maintenance delays (AFDC, 1999a), and each en route location provides some level of personnel, supply, and support equipment (721st AMOG, 2003). AMC en route support bases are established within the continental United States (CONUS) and outside the continental United States (OCONUS); however, AMC aircraft fly to hundreds of locations with little or no logistical support (AMC, 2002b). This fact raises the issue of effectiveness of OCONUS en route logistics support to off-station AMC aircraft compared to other OCONUS non en route locations with limited or no logistic support available.

Purpose

The purpose of this research is to assess the effectiveness of AMC's OCONUS en route infrastructure in reducing mission delays on AMC aircraft due to aircraft maintenance problems. Effectiveness, in the context of the study, is measured by determining the amount of time an aircraft is disabled or broken. The period that an AMC mission is unable to continue due to aircraft maintenance is known not mission capable (NMC) time and a lower number of NMC hours indicate a shorter or reduced mission delay. For this study, the average NMC time establishes the baseline for measuring effectiveness.

The measurement of effectiveness in this research focuses on two factors: where the disabled aircraft is located and what type of aircraft is broken. The geographical location of the NMC aircraft is critical to comparing effectiveness by specific locations, by regions, or by levels of logistic support available. For example, OCONUS en route effectiveness can be accessed by comparing all AMC OCONUS en route location against OCONUS non en route locations. The aircraft type is known as the mission, design, and series (MDS) and Figure 1 gives a basic example of the MDS designation system (Department of the Air Force (DAF), 2005). This research will focus on the six primary AMC aircraft fleets; specifically C-5, C-17, C-141, C-130, KC-10, and KC-135 aircraft. Analyzing the geographic location and MDS provides a greater level of detail into the performance of the en route structure and the AMC logistic support process for repairing off-station aircraft.

Figure 1. MDS Designation System Example



Information derived from Department of the Air Force (DAF), (2005).

To achieve the purpose of this research, a data analysis will be conducted on the logistic support records performed by the AMC Logistic Readiness Center (LRC) over a five-year period. The AMC Global Decision Support System (GDSS) is the source of the data and provides in-depth coverage of each logistic support effort. From this data, average NMC times between OCONUS en route locations and non-en route locations can be compared. An assessment of the effectiveness of the en route infrastructure in reducing mission delays due to aircraft maintenance will be derived from the differences in average NMC time and applied statistical tests results.

Benefits

The primary benefit of this research is that it establishes a baseline of logistic support information for two of AMC key decision-making agencies. The first agency is the sponsor of this study (AMC Directorate of Logistics), which manages the logistic support and aircraft maintenance policies for all AMC aircraft. Providing an assessment of whether the OCONUS en route support infrastructure minimizes average NMC time more effectively than OCONUS non en route locations allows AMC logisticians to identify areas requiring further analysis. By examining the locations where AMC aircraft require logistic support and the MDS of the aircraft supported, logisticians can identify strengths or weakness in the AMC en route support infrastructure. From a logistics perspective, key resources such as manning levels, supply stocks, and equipment availability may require adjustment to fine tune the level of logistics support available at a specific location or across all en route locations. The ultimate goal of these types of adjustments is to maximize en route effectiveness by reducing logistic related mission delays.

The second agency that will find utility in this research is the Tanker/Airlift Control Center (TACC) located within AMC Headquarters. This agency is the task with managing the planning, execution, and support of all AMC missions. Mission managers in TACC/XOC and the LRC work hand-in-hand to return a disabled aircraft performing AMC missions to mission capable status in minimum time. By referring to the statistical analysis of past logistic support performance, TACC mission managers can make decisions regarding aircrew rest periods and mission changes. For example, if a NMC aircraft requires logistic support at specific location, the mission manager could apply the results of this study and decide if the aircrew should go into crew rest period or standby as maintenance is performed.

Literature Review

Preface

The fundamental concepts involved in the off-station logistical support and the AMC en route support infrastructure are detailed in the following review of literature. Several key points will be addressed to clarify the AMC en route support philosophy. Previous research related to the AMC logistic support process will be introduced prior to focusing on the en route support infrastructure. An explanation of the air mobility support infrastructure will be provided to identify key agencies and describe the organizational support structure employed to sustain AMC's global operations. The coordination required between operations, maintenance, supply, and transportation elements to return a NMC aircraft to fully mission capable (FMC) status is discussed in a synopsis of the AMC logistic support process. The review will conclude with an evaluation of each of the individual MDS support requirements and their predicted influences on the average NMC time by level of support available (e.g., en route or non en route support).

Key Points

There are several key points that need highlighting to increase the reader's understanding of AMC logistics support philosophy. This study encompasses a 5-year window (1 January 2000 to 31 December 2004) of AMC logistics support. During this period unit designation, aircraft fleet composition, and en route locations have changed. The basic logistic support process has remained the same however, and this study will attempt to highlight the changes as necessary.

The Global Decision Support System (WinGDSS, version 4.4) is a software application that is used throughout AMC to capture data pertaining to mission management, aerial port coordination, and aircraft maintenance actions. The LRC functions of the GDSS application store all of the maintenance actions taken for each NMC aircraft support. Each aircraft support creates a record for that NMC aircraft and the "Remarks" sub-function is a comprehensive logbook capturing "real time" inputs as the support procedure progresses. These remarks provide critical data on how a specific aircraft was repaired and this information is referenced throughout this study (AMC, 2002b).

An AMC airlift mission differs from other Air Force missions in that the aircraft leaves home station and flies a series of sorties or mission segments before returning to home station. This mission profile requires the aircraft to be "off-station" for extended periods and increases dependency on the en route support infrastructure (AMC, 2004).

An "off-station" AMC aircraft is any aircraft performing an AMC-funded mission (as specified by the mission number) regardless of the aircraft's home unit. For example, an Air Force Reserve Command (AFRC) C-141 flying an AMC-funded airlift mission or an Air National Guard (ANG) KC-135 flying an AMC-funded air refueling mission are both considered AMC aircraft for those missions (AMC, 2004).

AMC aircraft may divert to their respective home station for logistics support as required. The NMC aircraft will be considered "off-station" for the purpose of mission visibility. For example, a Dover Air Force Base (AFB) C-5 mission may be scheduled to fly from Norfolk Naval Station (NS) to Lajes AB, Azores. On departure from Norfolk, a maintenance (MX) problem occurs and requires the C-5 to divert back to Dover for repair. During this time, the aircraft is support by AMC as if it was away from home station and in this case, Dover is essentially an en route location (AMC, 2002b).

Previous Research

Limited sources resulted from the search for information regarding the specific topic of AMC en route support infrastructure. Several documents were found in a broader subject search of logistics support of air mobility assets, to include three basic areas related to this research: (a) supporting expeditionary aerospace forces, (b) maintaining a logistic pipeline, and (c) maximizing aircraft availability. A more detailed discussion of these areas, to include relevant contributions of the previous research will be discussed.

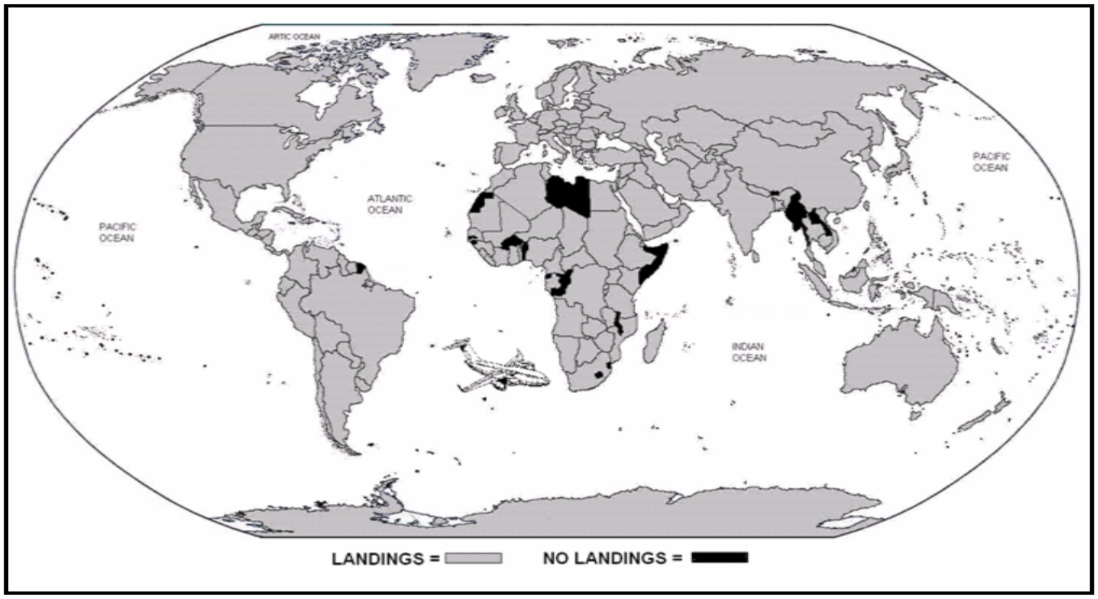
Expeditionary Aerospace Forces. World events and political climates dictate where and how quickly U. S. military forces deploy. The rapid mobilization involved with OPERATION Desert Shield and the current Global War on Terrorism (GWOT) are two examples of how the U. S. military can move from a relatively relaxed posture to full-scaled combat operations in a very short time span.

Supporting expeditionary aerospace forces is a complex task and decisions regarding the locations, the level of logistical support required, and the timeframe given to deploy are made on the best information available at the time. The results of these decisions are critical to the overall success of the supported operation. An example of making the right decisions and the ability of the en route system to adapt is highlighted in the strategy employed in OPERATION Iraqi Freedom (OIF). In March 2003, Balad AB, Iraq, was a major Iraqi Air Force installation. As of June 2006, it was an AMC en route location with the busiest single runway in DoD and second busiest in the world, second only to London's Heathrow Airport (Thompson, 2006).

The decisions on supporting expeditionary aerospace forces affect AMC aircraft in several ways. The AMC airlift fleet (C-5, C-17, and C-141 aircraft) perform inter-theater support and normally do not deploy as expeditionary units (USJFCOM, 2003). However, these aircraft are called on to move troops, equipment, and medical support to and from the deployed locations. The AMC C-130 fleet performs intra-theater support (moving cargo within the combat theater) and operates as a deployed unit. AMC air refueling aircraft (KC-10s and KC-135s) also deploy as expeditionary units and provide in-flight refueling to a wide range of aircraft.

A determination regarding amount and type of logistics support provided per location should also be considered. Figure 2 depicts the countries in which AMC had at least one aircraft landing during the 2000 - 2004 timeframe and clearly demonstrates the truly global presence maintained by the U.S. armed forces. Many factors must be considered and numerous models have been developed to assist decision makers in determining the proper level and type of logistic support required at a specific location (Gillaspie, 1999). The forward support could be general in nature or tailored to a specific air mobility need. For example, during OPERATION Desert Storm, C-130 engine intermediate maintenance was consolidated at Rhein Main AB, Germany, for all C-130s participating in that operation (Tripp, Galway, Ramey, Amouzegar, & Peltz, 2000) and during operations in Kosovo, C-5 major inspections were performed at Moron AB, Spain (AMC, 2002b).

Figure 2. Countries Visited by AMC Aircraft (2000-2004)



Tanker/Airlift Control Center (TACC), (2005b).

After considering amount and type of support provided, consideration should be given to the location of the logistics support. The RAND Corporation study, *Flexbasing: Achieving Global Presence for Expeditionary Aerospace Forces* (Killingsworth, Galway, Kamiya, Nichiporuk, Ramey, Tripp, & Wendt, 2000) explained the importance of forward basing in the right location. The study also advocated the employment of Forward Supply Locations (FSL) and an en route support infrastructure. The transfer of the 8th Expeditionary Air Mobility Squadron (EAMS) from Prince Sultan AB, Saudi Arabia, to Al Udeid, Qatar, is an example redistributing en route assets to meet political constraints and mission requirements. This type of flexibility is crucial if AMC is to maintain a global presence. Lessons learned form operations in Afghanistan and Iraq further reinforce the en route support infrastructure. Two separate studies emphasized the importance of the FSL concept in supporting deployed aircraft (Lynch, Drew, Tripp, & Roll, Jr., 2005; Tripp, Lynch, Drew, & Chan, 2004).

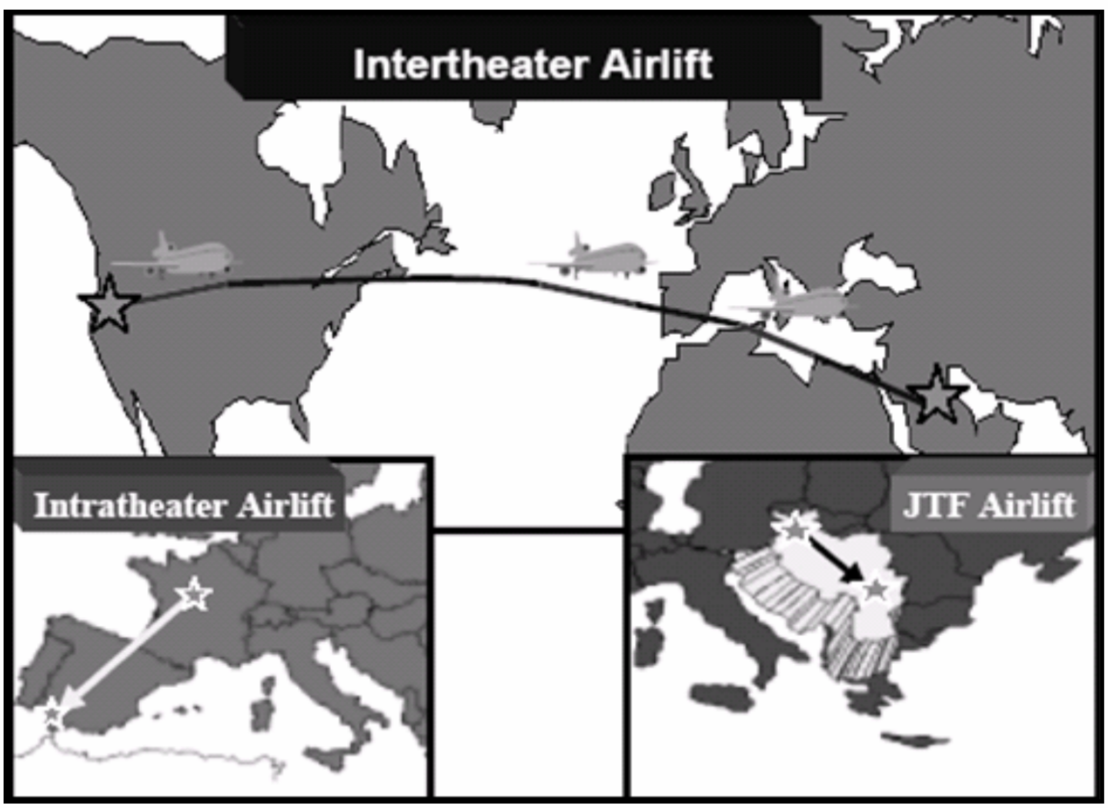
Getting the right amount of logistic support to the right location is a moving target and subject to constant review. World events, natural disasters, air base closures, and the introduction of new weapon systems have an effect on the air mobility system. The European and Pacific En Route Infrastructure Steering Committees (EERISC and PERISC, respectively) are tasked with ensuring the en route infrastructure is equipped to meet AMC's requirements (Salmond, 2005). Once the logistic requirements for supporting an expeditionary aerospace force are established, the challenge of keeping them supported begins immediately (AFDC, 2005). The ability to maintain an efficient logistics pipeline is a critical element in supporting our deployed forces.

Logistic Pipeline. AMC aircraft are both a key component and a beneficiary of maintaining a logistics pipeline. In some cases, an AMC aircraft may carry the "mission capable" (MICAP) part to an NMC aircraft and in other cases; a disabled AMC aircraft may need the MICAP part. This following section explains how AMC aircraft are utilized to keep the logistics pipeline flowing. From a joint operations perspective, the "logistics pipeline" is defined as,

> *The "distribution" or "logistic" pipeline is a channel through which the Department of Defense (DOD) conducts distribution operations. This pipeline represents the end-to-end flow of resources from supplier to consumer, and in some cases back to the supplier in retrograde activities. The supported combatant commander's perspective of the distribution pipeline is* ***divided into two portions; strategic and theater****. The strategic portion consists of points of origin or sources of support external to a supported theater. This portion provides a supported combatant commander with access to national assets outside the theater to support joint operations. The theater portion of the distribution pipeline comprises all the networks within theater through which materiel and units flow before reaching their final destination.* (USJFCOM, 2000, v)

The strategic and theater portions of the logistics pipeline correlate with the inter-theater and intra-theater roles of the AMC airlift fleet. The larger airlifters (e.g., C-5, C-17, and C-141 aircraft) create an "air bridge" from the CONUS supply points to the major aerial ports within the combat theater. Once in theater, C-17, C-141, and C-130 aircraft disperse the cargo to final destinations. In some cases, operational control of these aircraft may be transferred to a regional combatant commander under the Joint Task Force (JTF) concept illustrated in Figure 3. Additionally, the AMC air refueling fleet extends the range of the airlifters, reducing the need for fuel stops. The air refueling capability contributes to minimizing the NMC time of a disabled aircraft by decreasing the logistics response time.

Figure 3. Airlift Mission Classifications



AFDC, (1999b).

To reduce dependency on the logistics pipeline, Air Force units create forward supply points or deploy with aircraft spare part kits. A balance must be maintained between deploying robust mobility readiness spares packages (MRSP) and relying heavily on the logistic pipeline to provide logistic support when needed. The debate over the associated costs of maintaining large deployment spare kits versus the cost and time required to transport a MICAP part for a specific NMC aircraft has attracted much attention. The AMC OCONUS en route infrastructure relies on FSL for the inter-theater airlift fleet and utilizes the MRSP concept for the C-130, KC-10, and KC-135 fleets (AMC, 2002a). In either case, determining the correct amount of parts to have on hand is a necessary operational and economical requirement.

A model combining multiple MDS (B-52H, F-16C, and C-17A) spares kits suggested a potential cost saving and reduced parts inventory for the C-17A aircraft MRSP (Hester, 2001). This practice of combined supply stocks is standard at the OCONUS en route supply points and allows en route supply personnel visibility over multiple MDS parts in stock. For example, if a C-141 standard air data computer will work on a C-5, the part is pulled from stock and installed in the aircraft (AMC, 2002b). Reducing the MRSP for B-52H, F-15E, F-16C, and KC-135 aircraft and improving the logistic pipeline illustrated a potential savings in both the cost and size of the kits (Martinez, 2001). This study also highlighted a significant saving in cost and airlift requirements if the FSL concept was employed for other aircraft outside of AMC.

Simply reducing an aircraft's MRSP is not smart logistics management and determining what parts are required is the focus of stockage effectiveness measurements. Previous research shows that in some cases, less than 10% of the spares package were actually used (Smith, 2004). In cases where the required part is out of stock or not carried, other options may be used to repair an NMC aircraft.

The practice of aircraft part cannibalization is the removal of a functioning part from one aircraft to another to repair an NMC condition. This does not negate the need to requisition a part from supply, but it does allow mission flexibility if the estimated arrival time (ETA) for the needed part would create a significant mission delay. Two separate studies highlighted the positive impact of cannibalization actions (Hester, 2001; Ramey, 1999). Both researchers demonstrated that the practice of cannibalization could reduce the number of items required in a spares kit. Though cannibalization is an alternative method of support, the practice is particularly effective among AMC deployed C-130, KC-10, and KC-135 (AMC, 2002b). Additionally, en route locations will cannibalize parts for high priority missions (AMC, 2002b).

When a required part is not available on station and cannibalization is not an option, the part must be shipped to the NMC aircraft. AMC strives to utilize the most efficient and expeditious transportation method available in each case (AMC, 1997). The two primary options used are commercial shipping such as Fed-Ex or United Parcel Service (UPS) or organic AMC airlift. In some cases, combinations of both are used (AMC, 2002b). Previous research determining which method provided better service, commercial shippers, from an economic standpoint, was a better value (Clavenna, 1996). Detailed data covering the transportation methods and amount of shipping time required per each logistic support is captured in the WinGDSS database. This study did not address the specific methods for the movement of high priority MICAP parts; however, the effect of the in-transit shipping times is captured in the overall NMC time for each logistic support record. Maintaining the logistics pipeline is a demanding task and MRSP management, aircraft part cannibalization, and transportation efficiency are only part of a larger puzzle. The effects of these issues on the AMC logistics pipeline will be evident in this research.

Aircraft Availability. Without a well-devised support plan for our expeditionary forces and an efficient logistic pipeline, aircraft availability will likely suffer. Aircraft availability equates to how many aircraft can be utilized by mission planners to fly missions or pick up a mission when another aircraft is disabled.

An airfield's maintenance capability, material handling capability, the airfield characteristics, and fueling capability contribute to maximizing aircraft availability (Randall, 2004). Further explanation is offered in the following passage,

> *An airfield's capacity, or ability to service aircraft, is dependent on the purpose and placement of the airfield within the air mobility system. The rate at which available aircraft are created, therefore, is a function of the quantity and availability of critical resources allocated to a particular airfield.* (Randall, 2004, 65)

For example, the first time an AMC C-17 arrived in Kandahar, Afghanistan, during OPERATION Enduring Freedom (OEF), only limited ground support was available (AMC, 2002b). As operations increased at this location, planning factors were used to determine the level of support required to reduce mission delays.

As with supporting expeditionary aerospace forces, numerous models have been designed to aid decision-makers in forecasting aircraft availability. Currently, AMC uses the Aircrew/Aircraft Tasking System (AATS) to predict aircraft availability command wide (Wall, 2004). The indicator used by the AMC/A4 (Directorate of Logistics) to determine aircraft availability is the mission capable (MC) rate (Wall, 2004). The MC rate is defined as the percentage of possessed hours that an aircraft can fly at least one of its assigned missions (AMC, 2003b). The en route's goal of reducing NMC time (i.e., minimizing aircraft maintenance delays) has a direct impact on AMC aircraft availability.

Another factor effecting aircraft availability within AMC is the aging air mobility fleet. As of September 2004, the average age combined KC-135 fleet (active duty, AFRC, and ANG aircraft) was over 42 years. C-5, C-141, and C-130 aircraft averaged 30 years or more in service. Only the C-17 and KC-10 aircraft fleets averaged less than 20 years of service (Mehuron, 2005). Refer to Appendix A, Table A1, for an average age of years in service for the AMC fleet by MDS and operating agency (i.e., Active duty, AFRC, and ANG).

Maintenance issues associated with aircraft aging include corrosion, skin weakness, frayed electrical wiring, and unanticipated component failures (Hebert, 2004). Some specific examples of the affects of aging are the cracks discovered in the C-141 fuel tank weep holes, the cracks also found in the C-5 horizontal stabilizer tie box fittings, and the failure of the KC-135 stabilizer trim actuators. In all cases, these discoveries have proved costly in labor (repeated inspections required to monitor the condition), funding (the costs associated with repair and replacement), and aircraft availability (grounding the fleet or flight restrictions) (Pyles, 1999).

As an airframe's total operating hours increase, the probability of a system or sub-system failure tends to increase as well, thereby decreasing the airframe's reliability and maintainability (R&M). In *An Introduction to Reliability and Maintainability Engineering,* Ebeling (1997, 5-6) offers these definitions of R&M,

Reliability is defined as the probability that a component or system will perform a required function for a given period of time when used under stated operating conditions.

Maintainability is defined as the probability that a failed component or system will be restored or repaired to a specified condition within a period of time when maintenance is performed in accordance with prescribed procedures.

The direct impact of aircraft aging on reliability is further explained in the Air Force Journal of Logistics article "*Forecasting Readiness*":

As a system's cumulative operating time increases, the probability of its failure tends to increase, decreasing the system's potential reliability. Reliability also decreases when the conditions under which the system was designed to operate change. The average Air Force aircraft is 20 years old, with 40 percent of the fleet 25 years or older. Many of these aircraft are at critical points in their life cycles. (Oliver, Johnson, White III, & Arostegui, 2001, 49)

The level of aircraft R&M has direct influence on the overall health of the fleet (Wall, 2004). The total not mission capable (TNMC) rate is a primary indicator used to measure the health of a specific aircraft fleet. TNCM is divided into two primary categories; total not mission capable for maintenance (TNMCM) which describes the percentage of aircraft NMC due to one or more maintenance conditions, and total not mission capable for supply (TNMCS) which describes the percentage of aircraft NMC due to the unavailability of spare parts (Oliver, et al., 2001)**.**

As AMC's aircraft fleet continue to age, the R&M factors increase the maintenance workload and the frequency of logistics supports increase. Additionally, the amount of NMC time increases as parts become limited in the supply chain (Pyles, 1999). All of these factors can have a negative effect on aircraft availability.

The research discussed in the previous section builds the foundation for the basic support concepts examined within this study. Supporting expeditionary aerospace forces, maintaining a logistic pipeline, and maximizing aircraft availability are all key factors in enhancing the effectiveness of en route support locations in reducing mission delays due to aircraft maintenance problems. The employment and management of the AMC en route infrastructure will be presented next.

Air Mobility Support Infrastructure

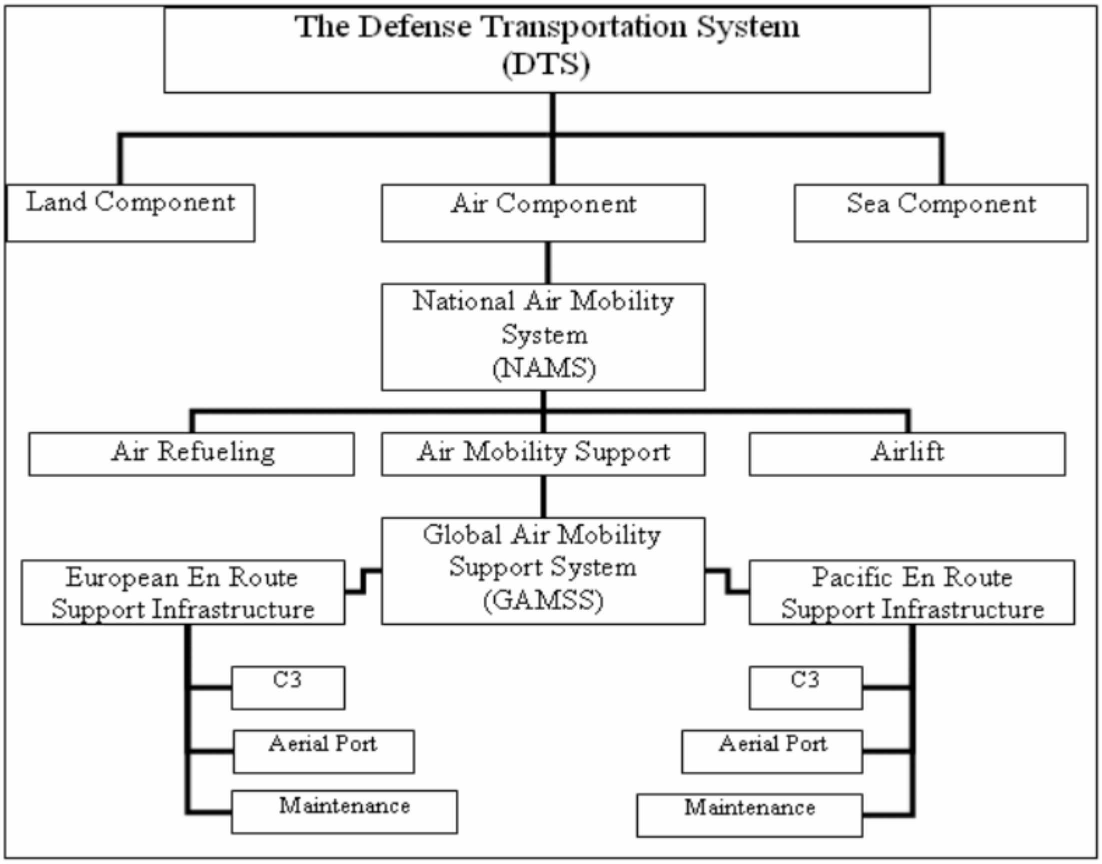
The infrastructure employed by AMC to provide air mobility support is a sub-system of a much larger system. This section outlines the management levels of the transportation system, focuses on the specific core functions of the air mobility support infrastructure: (a) command, control, and communications (C^3), (b) aerial port; and (c) aircraft maintenance (USJFCOM, 2002), and discusses the AMC en route support structure at each level.

The U.S. military uses a complex and extensive system to transport everything from small packages to several hundred tons of equipment and supplies. Additionally, personnel movements ranging from a single high-ranking officer to rapid deployments of entire military units depend on this system. This system can be broken down into three managerial levels: (a) the Defense Transportation System, (b) the National Air Mobility System, and (c) the Global Air Mobility Support System.

The Defense Transportation System. The DoD relies on the Defense Transportation System (DTS) to provide shipping, tracking, and receiving capabilities on a global basis. This system is composed of several levels and numerous components as displayed in Figure 4. The DTS is defined as:

That portion of the Nation's transportation infrastructure that supports Department of Defense common-user transportation needs across the range of military operations. It consists of those common-user military and commercial assets, services, and systems organic to, contracted for, or controlled by the Department of Defense. (USJFCOM, 2003, I-1)

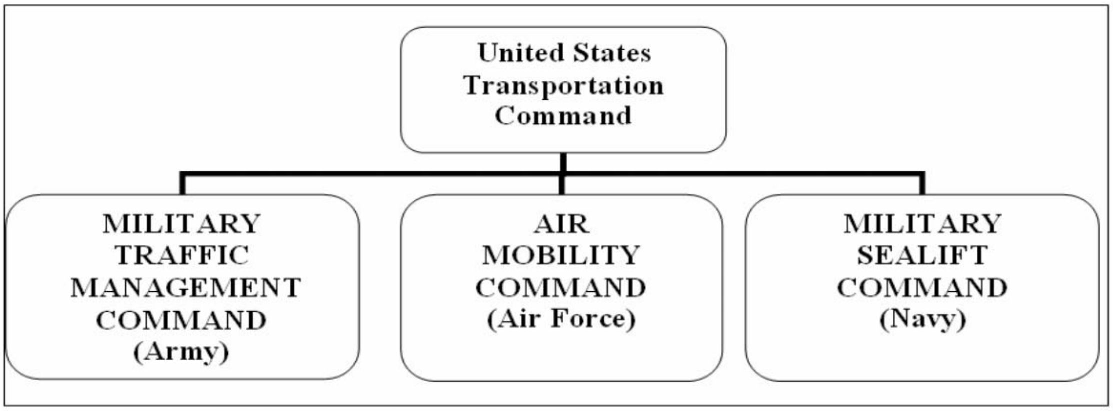
Figure 4. Defense Transportation System



Information derived from multiple sources.

Management of the DTS is delegated to USTRANSCOM, which utilizes components from the Army, Navy, and Air Force as described in Figure 5. In addition to the military resources, USTRANSCOM will use civilian transportation services, both foreign and domestic, to fulfill mission requirements as applicable. The full spectrum of DoD transporting methods include land (roads, railways, and pipelines), sealift, and airlift resources. This study focuses on the air mobility components of the DTS.

Figure 5. USTRANSCOM Component Commands



Information derived from USJFCOM, (2003).

The National Air Mobility System. The next management level of the DTS following the air component path of Figure 4 is the National Air Mobility System (NAMS). The NAMS is composed of three distinct air mobility forces divided into the following categories: (a) mobility forces under the direct command of authority of USTRANSCOM (AMC assets), (b) mobility forces under the command authority of geographic combatant commanders (CENTAF, PACAF, and USAFE assets), and (c) mobility forces organic to other services (Army, Navy, and Marine Corps assets) (USJFCOM, 2002). These forces depend on the efforts of active duty, AFRC, ANG, and civil air transportation partners to fulfill air mobility requirements (AFDC, 1999a). As discussed in the previous logistics pipeline section, these forces are utilized for inter-theater, intra-theater, or JTF air mobility operations (AFDC, 2000).

As stated in the following definition, the NAMS integrates the primary functions of airlift, air refueling, and air mobility support through mobility air forces (MAF) to provide rapid global mobility. The NAMS is defines as:

> *A broad and comprehensive system of civilian and military capabilities and organizations that provides the President and Secretary of Defense and combatant commanders with rapid global mobility. This system effectively integrates the management of airlift, air refueling, and air mobility support assets, processes, and procedures into an integrated whole*. (USJFCOM, 2002, GL-18)

Airlift involves the transportation of personnel and materiel through the air, which can be applied across the entire range of military operations to achieve or support objectives (AFDC, 2003). Airlift missions include four basic missions encompassing passenger and cargo movement, combat employment and sustainment, aeromedical evacuation (AE), and special operations support (AFDC, 1999b).

Air refueling involves the in-flight transfer of fuel between tanker and receiver aircraft. Air refueling aircraft perform critical functions in rapid air mobility by increasing range or endurance of receiver aircraft (force enabler) and by allowing aircraft to take off with higher payloads and not sacrifice payload for fuel (force multiplier) (AFDC, 2003). Tanker aircraft are tasked with a wide range of missions to include dual role functions when they accomplish airlift and air refueling on the same mission (AFDC, 1999c).

Airlift and air refueling operations can act in concert or independent of each other, however, neither operation can prove successful without air mobility support (AFDC, 1999d). The air mobility triad, displayed in Figure 6, illustrates how air mobility support provides the foundation to airlift and air refueling. The next management level of the DTS is covered by air mobility support systems.

Figure 6. The Air Mobility Triad

AFDC, (1999a)

The Global Air Mobility Support System. The Global Air Mobility Support System (GAMSS) is comprised of air mobility support forces that provide responsive, worldwide support to airlift and air refueling operations. The GAMSS consists of permanent (but limited) en route support locations and deployable forces capable of augmenting the fixed en route locations or establishing new en route locations (USJFCOM, 2002). This study focuses on the permanent en route locations' support capabilities.

The GAMSS provides three core functions to enable mission accomplishment: (a) C^3 network, (b) aerial port, and (c) aircraft maintenance. The level of support provided by an en route location varies and can be modified to suit current operations. The en route locations coordinate their actions in each of the functions through TACC. Each of the three core functions is critical to the logistic support process and examples of their application are provided below.

The C^3 Network. The command and control of each AMC airlift and air refueling mission is managed through TACC/XOC (Command and Control Directorate) and is maintained through the Air Mobility Control Center (AMCC) at each en route location (AFDC, 1999c). The C^3 network consists of several support systems providing in-transit visibility (ITV) for cargo and passengers, decision support system (i.e. GDSS), and worldwide communications links comprised of radio, datalink, and satellite systems. The TACC/XOC mission managers use these tools to monitor each AMC mission and input adjustments as necessary.

The C^3 function of the AMC en route structure provides many benefits to the air mobility mission and the logistic support process. One example is the ability for AMC aircrews to call in maintenance problems while still in flight. This advance notification allows the LRC to plan a repair strategy before the aircraft arrives at its destination, resulting in reduced mission delays. Another benefit is the ability to divert an aircraft with a maintenance problem to another location. For example, an aircraft inbound to an austere location may be diverted in flight to a location with maintenance support to prevent excessive delays. In fact, numerous requirements for logistic support have been averted due to the C^3 capability provided by the GAMSS (AMC, 2002b).

Aerial Port. The management of the aerial port function is provided by the Aerial Port Control Center (APCC) under TACC/XOGX and is maintained through the Air Terminal Operations Centers (ATOC) located in over 70 locations (TACC, 2005a). The aerial port function provides ITV on the movement of all cargo and passengers within AMC. Shipment ITV is provided by systems like the Global Transportation Network (GTN) system and allows for the tracking and control of shipments and personnel movements. Additionally, this capability allows MICAP shipments to be redirected or cancelled as necessary and provides confirmation of delivery. The APCC controllers ensure ATOC personnel are aware of high priority MICAP moving through the mobility system to ensure proper handling. This "hands on" capability is critical in reducing shipping delays of parts, equipment, and personnel necessary to repair a NMC aircraft (AMC, 2002b).

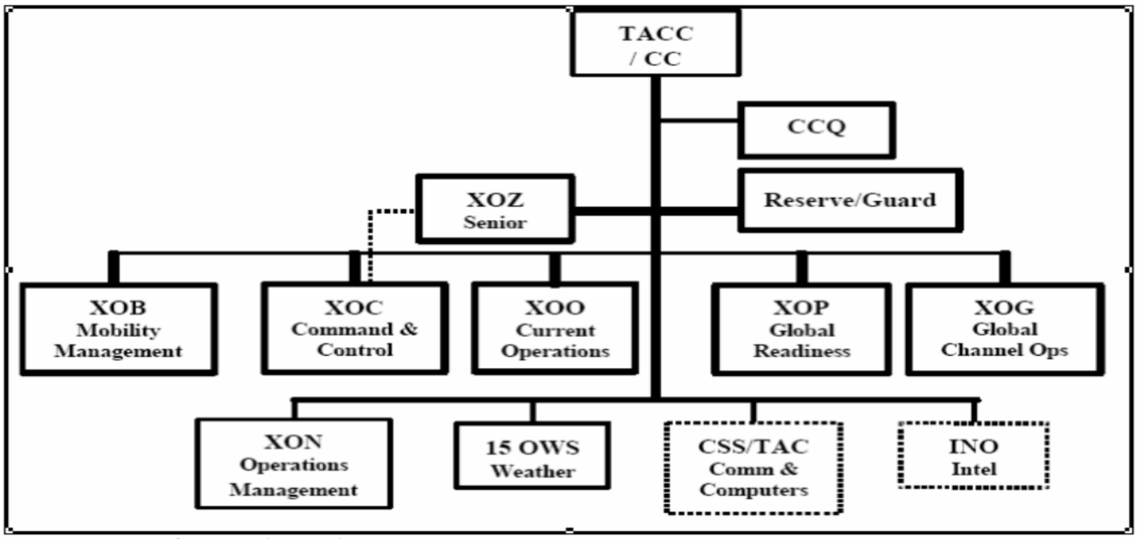
Aircraft Maintenance. The repair of AMC off-station NMC aircraft is managed through TACC/XOCL (LRC) and is coordinated with the Maintenance Operations Center (MOC) at each en route location (AMC, 2002a). The aircraft maintenance function at the en route locations strive to reduce mission delays by maintaining support equipment, managing aircraft part supplies, and providing aircraft system expertise. The establishment of the en route maintenance function greatly reduces the need to create logistic support packages for every off-station maintenance problem. The en route locations also provide an in-theater maintenance capability, eliminating the need for flying aircraft all the back to CONUS bases for repairs. How these en route maintenance units are organized is discussed in the next section.

AMC En Routes. The global mission of AMC creates a wide range of challenges for the command from both a mission management and a logistic support perspective. To meet these challenges, personnel assigned to AMC/A4 manage the manning levels and maintenance capabilities of the permanent en routes and the deployment of temporary support units, through the following organizational structure.

The responsibility for AMC's worldwide operational mission consisting of over 54,000 active duty troops and over 1,400 aircraft, is delegated to the Eighteenth Air Force

(18th AF). 18th AF is a streamlined organization that focuses the warfighting capability of the command through the TACC and two expeditionary mobility task forces (EMTF) (18th AF, 2005). The role of TACC in the en route support structure was previously discussed and TACC's organizational layout is provided in Figure 7.

Figure 7. TACC Organizational Chart

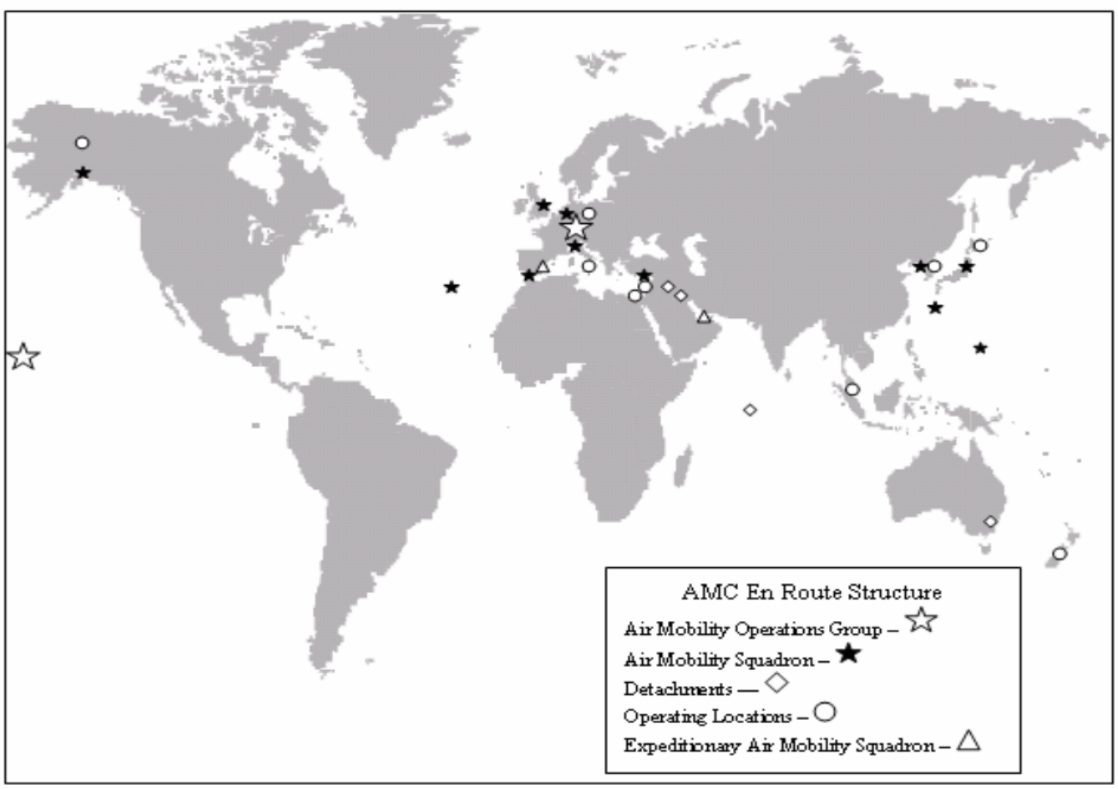


TACC, (2005a).

The expeditionary mobility task forces are tasked with providing skilled in-place and deployable air mobility support forces to rapidly establish, expand, sustain and coordinate air mobility operations through fixed OCONUS en route and CONUS based expeditionary support (15th EMFT, 2006). The 15th EMTF at Travis AFB, California, manages the Pacific en route support structure and the 21st EMTF at McGuire AFB, New Jersey, manages the European en route support structure. The EMTF staffs monitor trends and current operations within their areas of responsibility and make adjustments to reduce mission delays. For instance, the 15th EMTF may direct the deployment of a Tanker / Airlift Control Element (TALCE) to provide additional support to the en route location at Osan AB, Korea, during a contingency operation.

The air mobility operations group provides the next managerial level and ensures that the en route locations are providing the core functions of C^3, aerial port, and aircraft maintenance to minimize mission delays. The 15th AMOG located at Hickam AB, Hawaii, manages the Pacific en route support structure and the 21st AMOG at Ramstein AB, Germany, manages the European en route support structure. Both AMOGs manage air mobility support squadrons (AMSS), operating locations (OL), and detachments with varying degrees of support capabilities. The level of aircraft maintenance support available is categorized as major, minor, or limited and the AMOG staffs ensure each en route location is manned and equipped to provide the designated level of support (AMC, 2003a). The locations of AMC en routes locations from 2000 – 2004 are depicted in Figure 8 and level of support provided at each location can be referenced in Appendix B.

Figure 8. Map of AMC En Route Locations



Information derived from Killingsworth, et al., (2000) and AMC (2003a).

The AMC/A4 provides the management of the maintenance personnel, equipment, and aircraft parts supply utilized by the en route location. AMC/A4 also publishes directives, policies, and guidance related to en route maintenance support (AMC, 2002a). The logistics support process is outlined in these publications and the process is explained in the next section.

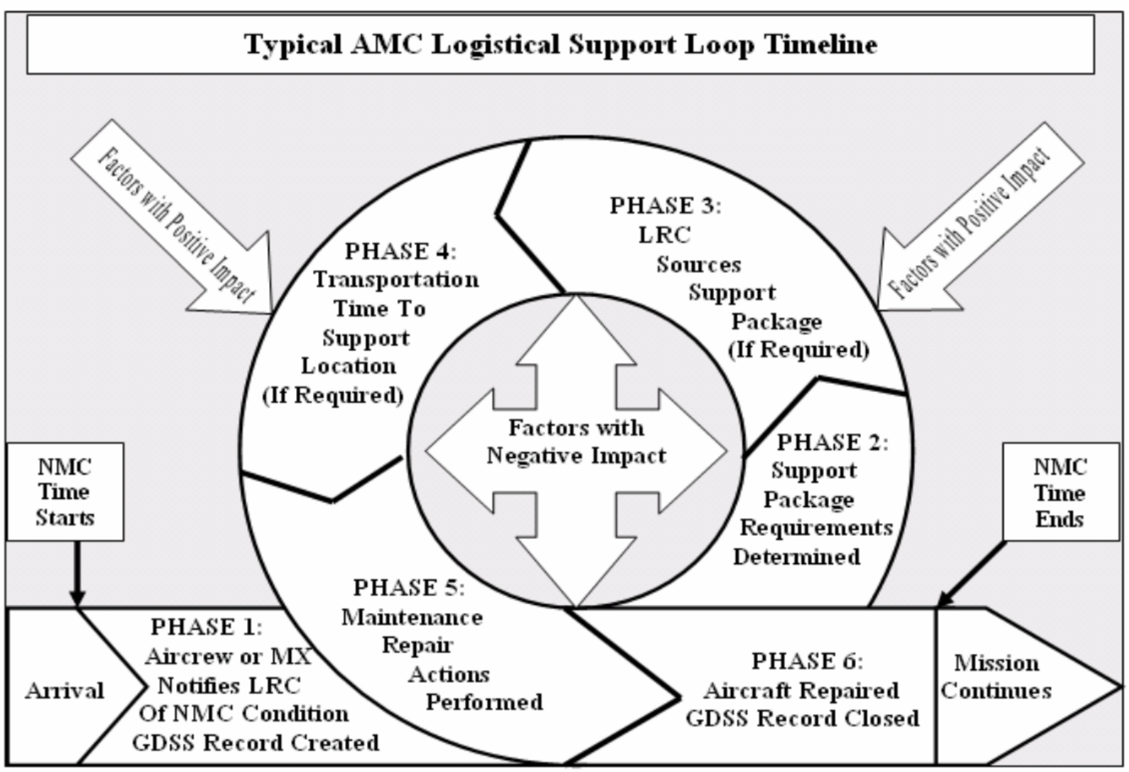
AMC Logistics Support Process

The information previously discussed in this chapter clearly illustrates the truly global nature of AMC's role. On the average, TACC manages over 340 missions a day (TACC, 2005b) and potential for delays exists at any stage of the mission. When an aircraft encounters a mission delay due to a maintenance problem, the AMC logistics support process is engaged to repair the aircraft as quickly as possible. The responsive of the logistic support process has direct impact on the en route's ability to minimize mission delays due to aircraft maintenance problems.

The generic definition of the AMC aircraft logistic support process within the context of this research consists of the monitoring of NMC mission aircraft and, as required, the movement of people, parts, or equipment, or a combination thereof from one or more source location to the disabled aircraft at another location (AMC, 2002a). Providing logistic support for AMC aircraft is challenging job and the specific requirements of each support effort may vary considerably. This is due mainly to the dynamic operating environment and the priority of the mission being supported. The LRC controllers often have to rely on innovation and experience to make a logistic support action successful. A main reason for this is that even when examining two separate support records with identical factors, the sourcing and routing of the support package may be completely different. For example, the support package for a C-5 tire change at Kuwait City International Airport on 1 February may have its parts, equipment, and maintenance personnel sourced from a completely different location than another C-5 with the same problem at the same location on 2 February. Additionally, the mode of transportation used may differ depending on that day's flight schedules and commercial options available.

Regardless of the specific requirements, the AMC logistic support process normally consists of four to six phases: (a) NMC notification, (b) troubleshooting, (c) sourcing, (d) transportation, (e) repair actions, and (f) FMC notification (AMC, 2002a). An illustration of the steps involved in the process is provided in Figure 9.

Figure 9. Support Loop Timeline



Information derived from AMC (2002a) and (2002b).

NMC Notification. The logistic support process begins when the LRC is notified that an AMC mission aircraft is NMC. This notification may come from the aircrew in-flight through the LRC, from the aircrew upon landing at a no AMC en route location, or from the en route AMOCC. Upon notification, the LRC controller receiving the information will create a record in GDSS to include the aircraft tail number and the maintenance discrepancies requiring support. When the GDSS record is created, the NMC time begins and will continue until all discrepancies are repaired and the aircraft is declared FMC. The total NMC time could be an hour or several weeks depending on the severity of the maintenance problem. This NMC time forms the basis for the analysis performed in this research.

Troubleshooting. When an aircrew lands at a non en route location, the level of maintenance diagnostics, referred to as troubleshooting, will normally be minimal. In some cases, the aircrew may be accompanied by maintenance personnel, which can assist in determining the source of the maintenance problem. If the aircraft lands at an en route location, maintenance will troubleshoot the problem and report the status to LRC.

Troubleshooting is critical in determining the composition of the support package. Once the exact problem can be pinpointed, the quicker the LRC can begin sourcing the required items. However, accurate troubleshooting is more important than quick estimates as inaccurate troubleshooting can lead to LRC having to resupport the aircraft and greatly increasing the total NMC time and overall mission delay (AMC, 2002b).

Sourcing. A support package may consist of a single part or a multiple-person maintenance recovery team (MRT) with several pallet positions of parts and equipment. However, it is important to note that even though all AMC mission aircraft delayed for maintenance issues report to the LRC and have a GDSS record created, not all situations require the sourcing of a support package. For example, en route support is specifically design to decrease the logistics support requirement. In these scenarios, the LRC is simply a monitoring agency, reporting aircraft status to AMC leadership (AMC, 2002b).

A preliminary analysis of the data collected for this study indicated that of the 16,101 records collected, only 4,284 records (26.6%) required MRT support and 9,382 records (58.3%) required any type of part shipment. Though only one-quarter of all AMC logistic supports required personnel or equipment and just over half of the supports required shipment of parts, all of the AMC logistic support actions considered in this study required some level of LRC coordination. A detailed support summary is offered in Table 1.

Table 1. Summary of Total Supports

Year	Total Supports	MRT Required	Percentage of Total Supports	Parts Required	Percentage of Total Supports
2000	3473	941	27.09%	2009	57.85%
2001	3521	961	27.29%	2030	57.65%
2002	3147	855	27.17%	1924	61.14%
2003	2603	713	27.39%	1534	58.93%
2004	3357	814	24.25%	1885	56.15%
TOTAL	**16101**	**4284**	**26.61%**	**9382**	**58.27%**

Data derived from the Global Decision Support System (AMC, 2002b).

In cases requiring the sourcing of logistic support package, there are three main elements: (a) MRT, (b) equipment, and (c) parts or supplies.

MRT. AMC units are tasked by the LRC to provided MRT support as needed and may require one or several Air Force Specialty Code (AFSC) skills. In cases where a parts courier is required, LRC will task the unit in the same manner even though the person will not perform maintenance. If feasible, LRC will coordinate with other MAJCOMs to utilize on station or in theater maintenance expertise. The LRC will track the MRT until return to home station is confirmed (AMC, 2002a).

Equipment. Equipment taskings can range from a small special tool, like a torque wrench, to an entire engine change package consisting of trailers, cranes, and a forklift. Regardless of the amount of equipment required, the tasking procedures are identical to that for a MRT and all pieces of equipment are tracked until returned to home station (AMC, 2002a).

Parts and Supplies. As previously indicated, part shipments comprise over half of all logistics support packages in this study. The parts required to repair a disabled aircraft may include a single gasket costing a few cents to a multi-million dollar engine support. Ironically, the small gasket may be more difficult to locate than the engine (AMC, 2002b). Supplies include consumables used during the maintenance actions, such as hydraulic fluid, oil, and sealants. LRC will notify AMC Regional Supply Squadron (AMC/RSS) of the requirement. The RSS sources the parts and arranges the shipping in close coordination with the LRC (AMC, 2002a).

In cases where the part is not available, LRC may authorize the cannibalization at an en route location to keep the mission moving or may task another AMC unit to cannibalize and ship the part. Cannibalization is dependent on the priority of the disabled aircraft's mission and is used on an "as needed" basis (AMC, 2002a).

Transportation. Once all of the components of the support package are sourced, the LRC determines the method of transportation. The determination is based on a "most expeditious" requirement and a wide variety of options are considered. The support package may be transported in any location on the globe by military air (MILAIR), commercially (e.g., FedEx or airlines), by surface (driven over the road), hand carried by courier, or any combination of methods (AMC, 1997).

If the MILAIR option is selected, the LRC forwards a transportation coordination request to TACC/APCC as a validation of "AMC MICAP" status. This status gives the support package priority throughout the AMC transportation system and expedites delivery (AMC, 1997). The movement of the package is closely monitored by the LRC until delivery is confirmed at the final destination (AMC, 2002a).

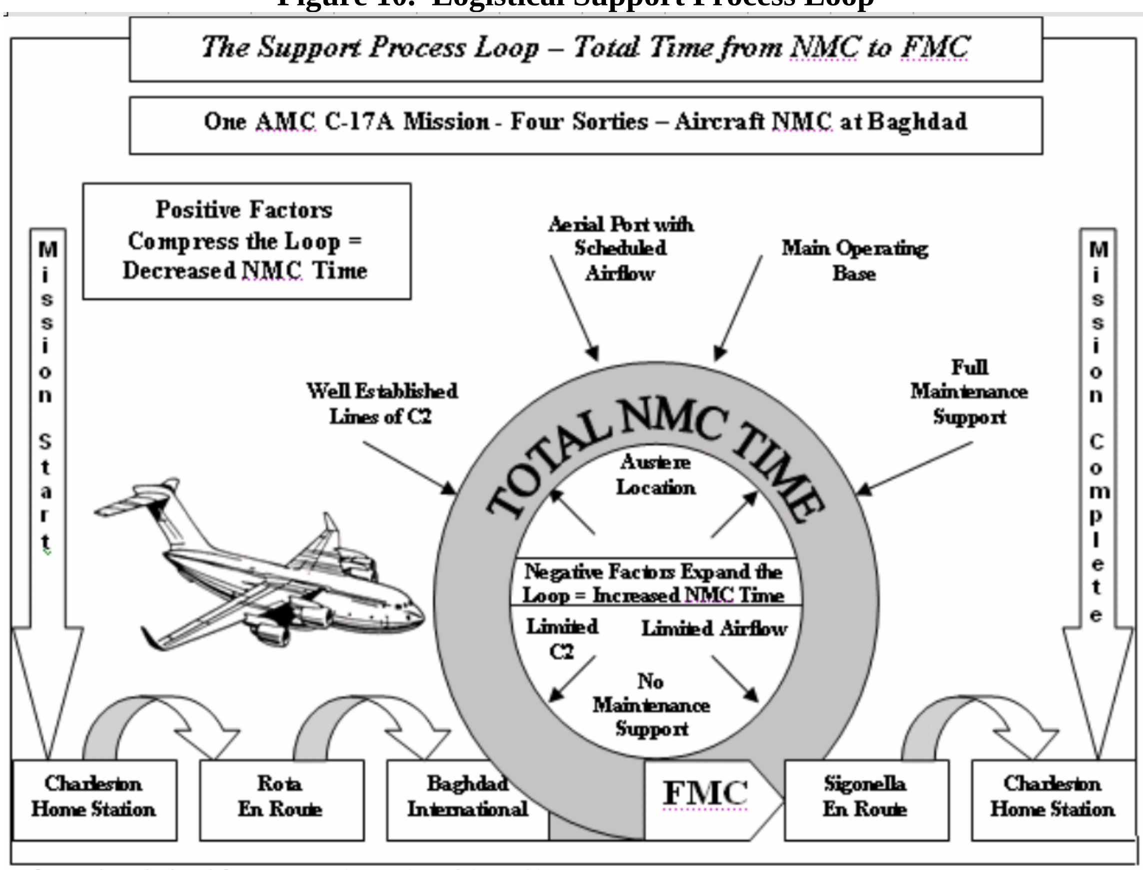
Referring back to Figure 9, it is clear to see that the omission of the sourcing and transportation steps can greatly compress the support loop (i.e., the total NMC time). However, if shipping a support package is required, the transportation time will normally make up the bulk of NMC time for that specific support (AMC, 2002b). This further emphasizes the importance of selecting the right levels of maintenance and supply support at en route locations. In addition, streamlining the transportation segment of the logistics support process can directly influence the overall NMC time.

Repair Actions. The steps taken to repair a maintenance problem can range from a quick replacement of a light bulb to major structural repair requiring several days to complete (AMC, 2002b). Repair action may begin immediately after the troubleshooting stage determines a course of action or may require waiting of a logistic support package to arrive. In some cases, the repair action reveals other problems with the system and further troubleshooting may be required. In a worse case scenario, subsequent support packages may be required, significantly increase the mission delay.

FMC Notification. If the maintenance actions are successful, the aircraft is returned to FMC status and can continue on the mission. The LRC receives the FMC notification and the GDSS record is updated and closed out. Closing the GDSS record stops the NMC clock and provides the total NMC time reference used in this study.

Regardless of the steps required in the process, for the support effort to be successful, close coordination between operations (i.e., aircrew and mission managers) and maintenance (i.e., the LRC and on station maintainers) must be maintained. Supply, transportation, and C^3 functions are also essential to success and require the same level of coordination (AMC, 2002a). With the explanation provided in this section, the logistic support process as applied to a typical AMC C-17 mission is illustrated in Figure 10.

Figure 10. Logistical Support Process Loop



Information derived from AMC (2002a) and (2002b).

The C-17 aircraft departs Charleston AFB, South Carolina, on a contingency support mission and proceeds to Rota NS, Spain. The aircraft completes the first leg or sortie of the mission and is FMC on arrival. The following day the aircraft departs Rota and flies to Balad AB, Iraq. Here the cargo is downloaded and the crew reports the aircraft is NMC for a flat #1 main landing gear tire. At this point, the crew notifies the LRC, a GDSS record is created, and the logistics support process begins. As illustrated in Figure 10, the level of support available at a specific location can act on the outside or the inside of the loop. Any one factor or combination of factors can act in a positive or negative manner.

For example, during the early stages of OIF, the limited support available at Balad AB could act as a negative factor pushing the loop outward, with corresponding increase in NMC time and a longer mission delay. Conversely, a change in the factors affecting the logistic support process can lead to reduced delays. For example, after the establishment of the AMC en route at Balad, the availability of parts, people and equipment result in the quick repair of the aircraft. The support loop is reduced in size; the total NMC time becomes shorter.

Once the aircraft is declared FMC, the GDSS record is closed out, and the C-17 departs on the next mission leg to Sigonella NAS. With no further delays at this point, the mission continues back to home station, and the mission is complete. The overall goal of LRC and the logistic support provided at the en route locations is to compress the off-station logistic support process loop and to reduce the mission delays due to maintenance.

Research Questions

The previous research presented along with the descriptions of the air mobility support infrastructure and the AMC logistic support process clearly illustrate the complexity of supporting expeditionary aerospace forces, maintaining a logistics pipeline, and maximizing aircraft availability. The location and capabilities of each AMC en route must be scrutinized to ensure the C^3, aircraft maintenance, and aerial port functions provide the necessary level of support. Additionally, the substantial investment in manpower, equipment, and supplies combined with the costs associated with providing air mobility support demand the maximum effectiveness possible. In accordance with this research objective and information provided above, the first research question is:

> *Research Question 1: Does the level of support provided by the C^3, logistics, and aerial port functions at AMC OCONUS en route locations minimize AMC aircraft mission delays, due to aircraft maintenance, such that the average NMC time for AMC aircraft will be lower at AMC OCONUS en route locations than at OCONUS non en route locations.*

Specific MDS Characteristics. Each of the AMC aircraft fleets provides a different capability and as a result, requires differing types and levels of support. These varying levels of support capabilities are described (in order of increasing capability) as either organizational, intermediate, or depot and are collectively known as a maintenance concept (DAF, 2004, 14). AFI 21-101 also gives a thorough explanation of each level:

> *Organizational - First level of maintenance performed on-equipment (directly on aerospace vehicles or support equipment at flight line level. Generally minor repairs, inspection, testing, or calibration.*

> *Intermediate - Second level of maintenance performed off-equipment (to removed component parts or equipment) at backshop level. Primarily testing and repair or replacement of component parts.*

Depot - Third level of maintenance performed on- or off-equipment at a major repair facility. Highest level of maintenance for more complex repairs.

Depot level maintenance is managed by Air Force Material Command (AFMC) and is provided through Air Logistics Centers (Mehuron, 2005). In addition to AFMC, other MAJCOMs may provide logistic support to AMC aircraft on an "as needed" basis through command-to-command agreements (AMC, 2003a). For example, Air Combat Command (ACC) and Air Force Special Operations Command (AFSOC) may assist with C-130 aircraft. United States Air Forces Europe (USAFE) and Pacific Air Forces (PACAF) also provide assistance for KC-135 aircraft. Air Training and Education Command (AETC), AFRC, and ANG units provide support to AMC aircraft and conversely, request support when flying AMC funded missions involving C-5, C-17, C-141, C-130, and KC-135 aircraft (AMC, 2002b),

The following section discusses the locations and level of support available to each MDS during the 2000 – 2004 timeframe. Unless otherwise cited, the United States Air Force (USAF) Almanac 2006 (Young, 2005), is the source of information for the following aircraft descriptions.

C-5 Galaxy. The C-5 is one of the largest aircraft in the world and is a critical AMC airlift asset. The Galaxy is used as a heavy-lift, air refuelable cargo transport for massive strategic airlift over long ranges, including outsize cargo, such as helicopters and tanks. Additionally, the C-5 can deliver 250,000 pounds of humanitarian relief, 340 passengers, or can be utilized for airdrop and special operation missions. The first C-5 flew in June 1968 and as of 30 September 2004, 118 C-5 aircraft remain of the original 131 produced by Lockheed-Martin Corporation.

There are three variants of the C-5 currently flying in the AMC fleet. The C-5A is the original version and has been the subject of much research regarding system reliability and maintainability in an effort to reduce logistic costs and improve aircraft availability. The C-5B is similar to the "A-model" with several modifications, which include strengthened wings, improved turbofans, and updated avionics, with color weather radar and triple inertial navigation system (INS). Two C-5C aircraft were modified to carry outsize payloads for the National Aeronautics and Space Administration (NASA) by extending the cargo bay and modifying the aft cargo doors.

AMC en route locations are funded to provide C-5 maintenance support, and the level of support provided depends on the en route capability (e.g., major, minor, or limited en route). Appendix C, Table C1 summarizes C-5 logistic support locations available from 2000 - 2004. These locations provided sources for MRT, equipment, and part requirements and potential repair locations of off-station AMC aircraft.

The information provided presents a cursory overview of the C-5 aircraft and outlines the support infrastructure available. To assess the en route support effectiveness specific to the AMC C-5 fleet, the second research question is:

> *Research Question 1a: Does the level of support provided by the C^3, logistics, and aerial port functions at AMC OCONUS en route locations minimize C-5 mission delays, due to aircraft maintenance, such that the average C-5 NMC time will be lower at AMC OCONUS en route locations than at OCONUS non en route locations.*

C-17 Globemaster III. The C-17 is a heavy-lift, air refuelable cargo transport capable of inter-theater and intra-theater airlift. Additionally, the C-17 can deliver 189 passengers, 102 paratroopers, or can be configured to move a M1A1 Abrams tank or three Apache helicopters. The first C-17 flew on September 1991 and as of 30

September 2004, 126 C-17 aircraft were in the inventory with the final production of 180 expected. Original production began with McDonnell-Douglas, and has now been assumed by Boeing.

The C-17A is the only version currently flying in the AMC fleet. The C-17A only requires a two-person crew due to extensive computerized flight management systems and digital fly-by-wire control systems. Though the C-17 represents the newest technology in the AMC fleet, it is constantly being retrofitted with system modifications. This modification program leads to significant differences in each C-17's basic systems configuration and can lead to maintainability problems until the entire fleet is completed in 2010.

AMC en route locations are funded to provide C-17 maintenance support, and the level of support provided depends on the en route capability (e.g., major, minor, or limited en route). Appendix C, Table C2 summarizes C-17 logistic support locations available from 2000 - 2004. These locations provided sources for MRT, equipment, and part requirements and potential repair locations of off-station AMC aircraft.

The information provided presents a cursory overview of the C-17 aircraft and outlines the support infrastructure available. To assess the en route support effectiveness specific to the AMC C-17 fleet, the third research question is:

> *Research Question 1b: Does the level of support provided by the C^3, logistics, and aerial port functions at AMC OCONUS en route locations minimize C-17 mission delays, due to aircraft maintenance, such that the average C-17 NMC time will be lower at AMC OCONUS en route locations than at OCONUS non en route locations.*

C-141 Starlifter. The C-141 has been the workhorse of the AMC fleet for over 40 years, providing airlift, airdrop, and aeromedical support. With air refueling the C-141 can deliver 13 pallets of cargo, 200 passengers, or 155 paratrooper anywhere in the world. The first C-141 flew in December 1963, and as of 30 September 2004, 20 C-141 aircraft remain of the original 285 produced by Lockheed-Martin Corporation. The last C-141 retired from service 6 May 2006 (Rhodes, 2006) and this study will capture the effects of the C-141 fleet drawdown as the C-17 assumes the Starlifter's role.

During this study, two variants of the C-141 were flying in the AMC fleet. The C-141 is a stretched version of the "A-model" with a 23 foot, 4 inch expanded fuselage, which increased cargo loads. The C-141C is operated by AFRC and ANG units and has been modified with a digital flight management system, computerized cockpit instrumentation, and an integrated global positioning system (GPS).

AMC en route locations were funded to provide C-141 maintenance support, however beginning in FY02 C-141 maintenance support entered the drawdown phase. The level of support provided depended on the en route capability (e.g., major, minor, or limited en route) (AMC, 2003a). Appendix C, Table C3 summarizes C-141 logistic support locations available from 2000 - 2004. These locations provided sources for MRT, equipment, and part requirements and potential repair locations of off-station AMC aircraft.

The information provided presents a cursory overview of the C-141 aircraft and outlines the support infrastructure available. To assess the en route support effectiveness specific to the AMC C-141 fleet, the fourth research question is:

> *Research Question 1c: Does the level of support provided by the C^3, logistics, and aerial port functions at AMC OCONUS en route locations minimize C-141 mission delays, due to aircraft maintenance, such that the average C-141 NMC time will be lower at AMC OCONUS en route locations than at OCONUS non en route locations.*

C-130 Hercules. The C-130 is capable of operating from dirt landing strip in austere location and provides AMC with both inter-theater and intra-theater airlift capability. Additionally, the C-130 can deliver 92 passengers, up to 64 paratroopers, or perform aeromedical evacuation of 72 patients. The first C-130 flew in August 1954 and as of 30 September 2004, 507 C-130 aircraft remain of the original 2,220 produced by Lockheed-Martin Corporation. There are an additional 168 C-130J aircraft planned.

There are three variants of the C-130 currently flying in the AMC fleet. The aging C-130E has undergone a wing modification to correct fatigue and corrosion problems will extend the life of the aircraft well into this century. Communications, navigation, and autopilot system modifications and GPS capability has been installed. The C-130H is similar to the "E-model" with several modifications, which include redesigned outer wings and improved avionics. The "H-model" has improved turboprop engine providing greater flight performance, increased cargo lift capability, and better engine reliability. The C-130J represents a significant improvement over the "E-model" with increased speed, range, and maximum ceiling. The "J-model" has a reduced crew requirement and six-bladed propeller, allowing for greater cargo loads.

AMC en route locations are not funded to provide C-130 maintenance support, however, C^3 and aerial ports functions are readily available. Appendix C, Table C4 summarizes C-130 logistic support locations available from 2000 - 2004. These locations provided sources for MRT, equipment, and part requirements and potential repair locations of off-station AMC aircraft.

The information provided presents a cursory overview of the C-130 aircraft and outlines the support infrastructure available. To assess the en route support effectiveness specific to the AMC C-130 fleet, the fifth research question is:

> *Research Question 1d: Does the level of support provided by the C^3, logistics, and aerial port functions at AMC OCONUS en route locations minimize C-130 mission delays, due to aircraft maintenance, such that the average C-130 NMC time will be lower at AMC OCONUS en route locations than at OCONUS non en route locations.*

KC-10A Extender. The KC-10 is an extremely versatile AMC asset that combines the tasks of tanker and cargo aircraft in a single unit, enabling it to support worldwide fighter deployments, strategic airlift, strategic reconnaissance, and conventional operations. The KC-10 can be air refueled by a KC-135 or another KC-10, increasing its range and diminishing the need for forward bases, leaving vital fuel supplies in the theater of operations untouched. KC-10A is a McDonnell-Douglas DC-10 Series 30CF, modified to include additional fuel tanks and air refueling equipment. Additionally, the KC-10 can deliver 17 pallets of cargo and 75 passengers, or 27 pallets in a cargo only configuration. The first KC-10 flew on April 1980 and as of 30 September 2004, 59 KC-10 aircraft remain of the original 60 produced by McDonnell-Douglas.

KC-10 aircraft utilize a contractor operated and maintained base supply (COMBS) system, which Boeing absorbed as the McDonnell-Douglas aircraft company dissolved. This supply system requires aggressive support efforts from the contractor and Boeing assists AMC logistic controllers in locating Federal Aviation Administration (FAA) certified parts from airlines around the world and has flown parts from their Boeing Aerospace Support Center in San Antonio, Texas, to the disabled aircraft (AMC, 2002b).

AMC en route locations are not funded to provide KC-10 maintenance support, however, C^3 and aerial ports functions are readily available. Appendix C, Table C5 summarizes KC-10 logistic support locations available from 2000 - 2004. These locations provided sources for MRT, equipment, and part requirements and potential repair locations of off-station AMC aircraft.

The information provided presents a cursory overview of the KC-10 aircraft and outlines the support infrastructure available. To assess the en route support effectiveness specific to the AMC KC-10 fleet, the sixth research question is:

> *Research Question 1e: Does the level of support provided by the C^3, logistics, and aerial port functions at AMC OCONUS en route locations minimize KC-10 mission delays, due to aircraft maintenance, such that the average KC-10 NMC time will be lower at AMC OCONUS en route locations than at OCONUS non en route locations.*

KC-135 Stratotanker. The KC-135 is the mainstay of the USAF tanker fleet, providing short- to medium-range air refueling needs of USAF bomber, fighter, cargo, and reconnaissance forces. It also capable of air refueling Navy, Marine Corps, and allied aircraft and can accommodate up to 80 passengers or small cargo movements. The original KC-135A was similar in size and appearance to a commercial Boeing 707 aircraft but was designed to military specifications, incorporating different structural details and materials. Numerous KC-135 "A-models" have been retired from service or modified to perform a myriad of special missions. The first KC-135 flew in August 1956 and as of 30 September 2004, 534 KC-135 aircraft remain of the original 732 produced by Boeing.

There are three variants of the KC-135 currently flying in the AMC fleet. The KC-135E is a re-engined KC-135A. Replacement of the J-57 turbojet engines with Pratt

& Whitney TF33-PW-102 turbofans increased the KC-135E fuel carrying capacity by 20 percent. The ANG and AFRC operate 115 KC-135E models, representing some of the oldest aircraft in the USAF inventory. The KC-135R have been re-engined with F108-CF-100 turbofans and received modifications to 25 systems and subsystems. The KC-135 "R-model" not only carries more fuel farther but also has reduced maintenance costs and requires shorter runways. KC-135T aircraft are re-designated KC-135Qs which were capable of refueling the now-retired SR-71s and retain the capability to carry different fuels in the wing and body tanks.

AMC en route locations are not funded to provide KC-135 maintenance support, however, C^3 and aerial ports functions are readily available. Appendix C, Table C6 summarizes KC-135 logistic support locations available from 2000 - 2004. These locations provided sources for MRT, equipment, and part requirements and potential repair locations of off-station AMC aircraft.

The information provided presents a cursory overview of the KC-135 aircraft and outlines the support infrastructure available. To assess the en route support effectiveness specific to the AMC KC-135 fleet, the seventh research question is:

> *Research Question 1f: Does the level of support provided by the C^3, logistics, and aerial port functions at AMC OCONUS en route locations minimize KC-135 mission delays, due to aircraft maintenance, such that the average KC-135 NMC time will be lower at AMC OCONUS en route locations than at OCONUS non en route locations.*

Methodology

Preface

The purpose of this chapter is to discuss the tools and techniques used to answer the research questions central to this thesis. A discussion of the data collection process will be presented first followed by an explanation of the average NMT time calculation. Next, an overview of the data analysis process used in this study is presented. The final section explains the statistical processes used to determine if any significant differences exist between en route and non en route location data.

Data Collection

The collection and preparation of five years of AMC logistics support tracking data from GDSS database will be presented first. The initial queries from the GDSS database provided a large amount of data covering each aspect of every logistic support coordinated by the AMC LRC during the 2000 – 2004 timeframe. The resulting data included three pieces of information critical to this study: a) the location of the disabled aircraft, b) the MDS of the disabled aircraft, and c) total NMC time for that logistic support effort. This data was then formatted to ease the analysis process. Formatting included excluding non-applicable records and importing the data from Excel spreadsheet to JMP$_{6.0}$® format for statistical analysis. Of the total 16,571 logistic support records originally obtained from the GDSS database, 470 records (2.8% of original GDSS data) were excluded. The remaining 16,101 logistics support records form the basis for this analysis. A summary of excluded records is shown in Table 2.

The excluded support records were deleted from this research due to following reasons: (a) classified location, (b) incomplete or erroneous data, or (c) aircraft MDS outside the scope of this study.

Table 2. Summary of Excluded Records

Reason for Exclusion	Year					
	2000	**2001**	**2002**	**2003**	**2004**	**Totals**
Classified Location	1	8	2	2	1	14
Erroneous Data	94	81	99	52	62	388
MDS Outside Research Scope	25	27	11	0	5	68
TOTALS	**120**	**116**	**112**	**54**	**68**	**470**

Data derived from the Global Decision Support System (AMC 2002b) and *Microsoft® Excel 2002* (Microsoft® Corporation, 2001).

Location. The first phase of the filtering process removed any logistic support record referencing a disabled aircraft at a classified location (see Classified Location row in Table 2). Records using the International Civil Aviation Organization (ICAO) location code beginning with "J" (ex. J102) indicate a classified location (International Civil Aviation Organization (ICAO), 2006). This step resulted in the exclusion of 14 logistic support records.

Data. The second phase of the filtering process removed any logistic support records containing missing, incorrect, or incomplete GDSS data (see Erroneous Data row in Table 2). For example, any GDSS records missing entries in the LOCATION, MDS, or TOTAL NMC TIME fields were removed. Using $JMP_{6.0}$®, a normal quantiles plot was performed on the remaining 16,181 GDSS records revealed several of these records have excessive NMC time, indicating outliers (SAS Institute, 2005). The excessive total NMC hours found in these support records are not indicative of the normal support process. Any of the remaining GDSS support records with a total NMC time above

450.1 hours was removed from the source data (99.5% of the data remained). This step resulted in the exclusion of 388 logistic support records.

MDS. The final phase of the filtering process removed any logistic support records containing an aircraft MDS other than the specific AMC aircraft referenced in the Introduction (see MDS Outside Research Scope row in Table 2). For example, records referencing C-9 or C-21 aircraft in the MDS field were removed. Although these aircraft types are AMC assets, a contractor logistics support (CLS) system is used to repaired disabled aircraft. The small AMC aircraft fleets do not rely on AMC LRC to provide support, except in rare occasions requiring LRC coordination in moving contract personnel or parts. Of note, the KC-10 fleet differs from the CLS fleets in that Air Force personnel maintain the aircraft and contractors manage the parts and equipment under the COMBS system explained in the Literature Review. This step resulted in the exclusion of 68 logistic support records.

Upon review of the remaining data, an error involving the correct ICAO locations codes was detected. The 16,101 logistic support events occurred at 514 separate locations. Seven of these ICAO location codes had been revised or were represented by duplicate codes (ICAO, 2006). The deleted information and the justification for revising the ICAO location codes are identified in Table 3. After completion of the data preparation phase, 16,101 logistic support records on six AMC aircraft types at 507 different locations remained.

Table 3. Summary of Revised ICAO Location Codes			
Deleted ICAO Location Code	**Revised ICAO Location Code**	**Geographic Location**	**Justification**
KIKR	KABQ	Albuquerque IAP / Kirtland AFB, New Mexico	Civilian airport and military base share same airfield
KNYL	KYUM	Yuma IAP / Yuma MCAS, Arizona	Civilian airport and military base share same airfield
OA1X	OAIX	Bagram AB, Afghanistan	Code revised due to Operation Enduring Freedom
OEKS	OEPS	Prince Sultan AB, Saudi Arabia	Code revised to military base expansion
ORBS	ORBI	Baghdad IAP, Iraq	Code revised due to Operation Iraqi Freedom
PHNL	PHIK	Honolulu IAP / Hickam AFB, Hawaii	Civilian airport and military base share same airfield
TJSU	TJSJ	Luis Munoz Marin IAP, San Juan, Puerto Rico	Civilian airport and military base share same airfield
International Civil Aviation Organization (ICAO, 2006).			

Measures

The primary goal of this research was to assess the effectiveness of AMC's OCONUS en route infrastructure in reducing mission delays on AMC aircraft due to aircraft maintenance problems. The comparison of average NMC time at OCONUS en route versus non en route locations provides a macro level evaluation of the en route system. The equation used to address Research Question 1 is a simple average NMC time calculation based on the total number of NMC hours accumulated divided by the total number of logistic support performed and is depicted in the following formula:

$$\frac{Total\ \ NMC\ \ Hours}{Total\ \ Number\ \ of\ \ Logistic\ \ Supports} = Average\ \ NMC\ \ Time$$

The equation used to address Research Questions 1a -1f were slight variations of the average NMC time equation:

$$\frac{Total\ NMC\ Hours\ by\ MDS}{Total\ Number\ of\ Logistic\ Supports\ by\ MDS} = Average\ NMC\ Time\ by\ MDS$$

In order to perform proper analysis, the logistic support data was formatted into the AMC off-station logistics support model template. The next section discusses the purpose and construction of the data analysis tool created with the $JMP_{6.0}$® software.

Data Analysis

The data analysis tool used in this research provides a two-fold purpose: (a) ease the analysis of logistics support data, and (b) provide a decision-support tool for the TACC mission managers. The analysis tool eases the analysis process by dividing the logistic support data by MDS and location. The locations are categorized as CONUS or OCONUS and then sub-divided as AMC en route or non en route in accordance with the information covered in the Literature Review. The data analysis tool also provides an instrument to AMC decision-makers by creating a single point of reference for estimating mission delays due to aircraft maintenance at a specific location, by MDS, and with a calculated level of confidence.

The data analysis tool is divided into two parts and organizes the elements of each logistic support into categories, which allows a wide range of comparative analysis. The first part of the analysis tool is used for raw data entry and can be supplemented with additional logistic support data at any interval (hourly, daily, or annually). For example, AMC logisticians could supplement the $JMP_{6.0}$® analysis tool with logistic support performed in 2005 and receive updated analysis results. The second part of the data analysis tool is the summary portion, which provides a quick reference for AMC decision-makers. The summary portion of the analysis tool auto-calculates entries from the raw data portion, thus allowing instantaneous updates for each location and MDS. In addition, the analysis tool consists of two sub-sections: location and MDS. The location sub-section provides an overview for each location performing a logistic support for an AMC aircraft. The MDS sub-section presents a macro level view of the average NMC time for each of the six primary AMC fleets.

The data analysis summary is broken into 16 columns of data for each location and MDS. A sample of the data analysis summary using the data from Keflavik Naval Air Station (NAS), Iceland (ICAO = BIKF) as an example is depicted in Table 4. See Appendix D, Table D1 for the full data analysis summary. A description and the formulas used to analyze the GDSS historical data used in the data analysis tool are provided in the following section.

Location (ICAO): (Table 4, Column 1). The ICAO location code was referenced from the *Location Indicators (ICAO Document 7910)* (ICAO, 2006). To locate logistic support records performed at Keflavik NAS, Iceland, the analysis tool was queried using *"Criteria: [Location = "BIKF"]"*. A total of 65 logistic support record were returned.

Fleet (MDS): (Table 4, Column 2). To examine individual MDS data at a selected location, the query was amended as follows: *"Criteria: [Location = "BIKF" AND MDS = "C130*"]"*. The asterisk is required to capture all series of the C-130 aircraft variants covered in this study (C-130E/H/J). The analysis tool is also capable of comparing the performance of each MDS variant (e.g. C-130E versus C-130H). The result of this query divides the 65 logistic support records at Keflavik NAS into six separate MDS rows.

Number of Supports (N): (Table 4, Column 3). This column refers to the total number of logistic support (GDSS support records) at a given location or category (e.g. OCONUS en route locations). To determine the total number of logistic supports for an MDS at a selected location, the following query was used: *"COUNT: [Location = "BIKF" AND Fleet = "C130*"]"*. The resulting number is the population (N) used in the remaining calculations. In this example, a total of 20 C-130 records were returned.

Table 4. Data Analysis Sample

Location (ICAO)	Fleet (MDS)	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ^2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
BIKF	**C-130**	**20**	**1410.4**	**70.5**	**59.4**	**7.0**	**168.5**	**161.5**	**47.5**	**2260.0**	**0.05**	**20.8**	**49.7**	**91.4**
BIKF	**C-141**	**18**	**694.5**	**38.6**	**31.9**	**11.5**	**102.5**	**91.0**	**23.4**	**546.7**	**0.05**	**10.8**	**27.8**	**49.4**
BIKF	**C-17**	**5**	**151.6**	**30.3**	**26.7**	**17.4**	**53.5**	**36.1**	**12.2**	**148.5**	**0.05**	**10.7**	**19.6**	**41.0**
BIKF	**C-5**	**8**	**628.0**	**78.5**	**62.5**	**31.5**	**157.5**	**126.0**	**45.9**	**2103.1**	**0.05**	**31.8**	**46.7**	**110.3**
BIKF	**KC-10**	**3**	**74.1**	**24.7**	**18.0**	**2.3**	**53.8**	**51.5**	**21.6**	**464.5**	**0.05**	**24.4**	**0.3**	**49.1**
BIKF	**KC-135**	**11**	**600.4**	**54.6**	**46.8**	**14.0**	**121.5**	**107.5**	**29.7**	**882.7**	**0.05**	**17.6**	**37.0**	**72.1**

Data derived from the *Global Decision Support System* (AMC, 2002b), *Microsoft® Excel 2002* (Microsoft® Corporation, 2001), and JMP$_{6.0}$®, *The Statistical Discovery Software* (SAS Institute, 2005).

Total NMC Hours: (Table 4, Column 4). To calculate the total NMC hours for all C-130 aircraft supported at Keflavik, the following query was used: *"SUM: Total NMC Time [Location = "BIKF" AND Fleet = "C130*"]"*. This action resulted in 1,410.4 total hours of C-130 NMC time at Keflavik.

Mean (μ): (Table 4, Column 5). To determine the mean (average) NMC time for C-130 aircraft at Keflavik, the total NMC hours was divided by the total number of supports, as in the following equation:

$$Population\ Mean\ (\mu) = \frac{1410.4}{20} = 70.5\ Hours$$

The query *"AVG: Total NMC Time [Location = "BIKF" AND Fleet = "C130*"]"* provided the following result for this example.

This calculation provides a basic reference for measuring the effectiveness of the logistic support process. However, to gain a higher level of confidence in the results, the following statistical analysis was used in the data analysis.

Median: (Table 4, Column 6). Determining the median point for a set of data allows the decision-maker to quickly ascertain if the distribution of the population is normal (mean and median are symmetrical) or skewed to the left or right of the mean (McClave, Benson, & Sincich, 2001). The median is determined by locating the number falling in the middle of the data set or population and is calculated by the following query: *"MEDIAN: [Location = "BIKF" AND Fleet = "C130*"]"*. In this example, the median of the 20 logistic supports is 59.4 NMC hours and to the left of the 70.5 NMC hour mean, which indicates the extended tail is to the right and the distribution is skewed to the right. This informs the decision-maker that many of the C-130 logistic supports at Keflavik are completed in less than the 70.5 hours represented by the mean.

Minimum NMC Hours: (Table 4, Column 7). The minimum NMC time represents the shortest recorded time to return a disabled aircraft to FMC. This number is the lower end of the total NMC time range and is determined by the following query: *"MIN: [Location = "BIKF" AND Fleet = "C130*"]".* For this example, the minimum NMC time is 7.0 hours.

Maximum NMC Hours: (Table 4, Column 8). The maximum NMC time represents the longest recorded time to return a disabled aircraft to FMC. This number is the higher end of the total NMC time range and is determined by the following query: *"MAX: [Location = "BIKF" AND Fleet = "C130*"]".* For this example, the minimum NMC time is 168.5 hours.

NMC Hour Range: (Table 4, Column 9). The NMC hour range is the simplest measure of the data dispersion. It gives the decision-maker a quick reference to the spread of data, but is limited if the high and low ends are atypical of the data (Leedy & Ormrod, 2001). The range is determined by *"Maximum NMC time – Minimum NMC time".* In this example, the NMC hour range equals 161.5 hours.

Standard Deviation (σ): (Table 4, Column 10). The standard deviation of the population is a measure of how widely values are dispersed from the mean. The differences between the range and the standard deviation are the differences between the dispersion of the data and the deviation from the data mean (McClave, et. al., 2001). For this example, the standard deviation was ± 47.5 hours

Variance (σ^2): (Table 4, Column 11). The population variance indicates the unpredictability of the data (McClave, et. al., 2001). Since variance equals the standard deviation squared, it acts as an amplifier of the data's inconsistency (i.e., the higher the variance, the less consistent or more random the data). In this case, the population variance for C-130 aircraft at Keflavik was 2260.0.

Alpha (α): (Table 4, Column 12). Alpha is the significance level used to determine the confidence level of the data. For this data analysis, alpha equals 0.05, which represents a confidence level of 95% ($100(1-\alpha) = 95$). The confidence level of 95% equates to a *z-value* of 1.96, which is used in the confidence interval calculations in the next section (McClave, et. al., 2001).

Confidence Interval: (Table 4, Column 13). The confidence interval is a range on either side of the sample means (Microsoft ® Corporation, 2001). This measurement reflects, to some degree, the reliability of the data. The confidence interval represents a key purpose of this study, providing a tool for the AMC mission managers for estimating mission delays due to aircraft maintenance. For example, if a C-130 aircraft encounters a maintenance delay at Keflavik NAS, the TACC mission manager can determine, with a particular level of confidence (95%), the earliest and latest the aircraft will be FMC. Using the total number of supports, the population mean, standard deviation, and the 0.05 alpha, the confidence level was 20.8 hours based on the following equation:

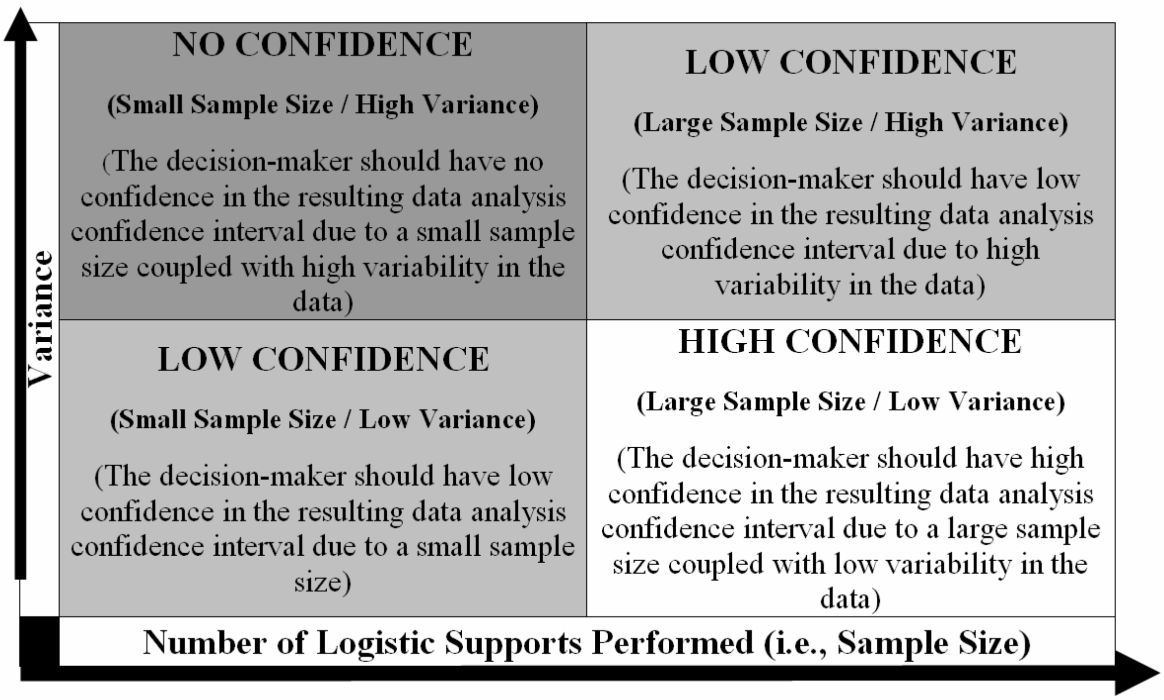
$$Confidence\ Interval = \bar{x} \pm 1.96\left(\frac{\sigma}{\sqrt{n}}\right) = 70.5 \pm 1.96\left(\frac{47.5}{\sqrt{20}}\right) = 20.8\ Hours$$

Estimated Minimum NMC Hours: (Table 4, Column 14). The estimated minimum NMC time represents the shortest estimated time to return a disabled aircraft to FMC based on the confidence interval calculations. This number represents the best-case scenario given the historical data for C-130 aircraft at Keflavik. The estimated times is based on the population mean minus the confidence interval. For this example, the estimated minimum NMC time was 49.7 hours.

Estimated Maximum NMC Hours: (Table 4, Column 15). The estimated maximum NMC time represents the longest estimated time to return a disabled aircraft to FMC based on the confidence interval calculations. This number represents the worst-case scenario given the historical data for C-130 aircraft at Keflavik. The estimated times is based on the population mean plus the confidence interval. For this example, the estimated minimum NMC time was 91.4 hours.

The data analysis tool provides a tremendous amount of data and affords the AMC logisticians and the TACC mission managers a flexible tool for estimating mission delays. The data analysis tool provides a confidence interval for each location and each MDS. However, the decision-maker should also consider the number of logistic supports at a location and the variability of the data. The logistic support decision matrix, depicted in Figure 11, illustrates the two key factors affecting the reliability of the data analysis tool; number of logistic supports and variability. The lower the number of logistics supports at a location, the lower the confidence in the estimated NMC time. In addition, a higher level of variance in the data may indicate unreliable data. By applying the matrix, the mission managers can make better decisions regarding crew management, mission re-cuts, or replacement of the NMC aircraft with a FMC aircraft (known as tail-swapping).

Figure 11. Logistic Support Decision Matrix



(Derived from McClave, et al, 2001)

Statistical Testing

The previous sections have explained how the data was prepared and how the average NMC time calculations were performed. However, a simple comparison of average NMC time between en route and non en route locations were insufficient in determining statistical significance of differences between the average NMC times (McClave, et. al., 2001; Leedy & Ormrod, 2001). The large amount of data points in each of the data groups evaluated allowed for either parametric or nonparametric testing. For large sample groups of greater than 100 data points, parametric testing is robust enough to provide accurate p-values even when the data distribution is far from Gaussian (normal) (SAS Institute, 2005). Of the fourteen data groups analyzed to address the research questions, all had greater than 100 data points. To increase reliability, this study employed both parametric and nonparametric testing to each comparison. In addition, three critical assumptions about the data sets were checked for validity (Leedy & Ormrod, 2001).

Assumptions. The first assumption of parametric testing is that the data reflect an interval or ratio scale (Leedy & Ormrod, 2001). The data used in this research is continuous and independent data on an interval scale based on the following explanations. The NMC times collected in this study are continuous in nature, meaning that values between 0.1 hours and an infinite point are acceptable. The GDSS database tracks NMC time to the nearest tenth of an hour and requires a value of at least 0.1 to create a logistic support record (AMC, 2002b). The logistic support data is also independent, because the NMC time of any specific support is not dependent or affected by any other logistic support results (McClave, et. al., 2001). Based on the definitions offered in Leedy & Ormrod (2001, 261), the measurement of NMC time is on an interval scale. Interval data reflects standard and equal units of measurement. In addition, differences between data points reflect equivalent differences across the data set (e.g. 10.0 NMC hours is twice as long as 5.0 NMC hours). The logistic support data queried from the GDSS database passes the validity check for the interval scale assumption.

The second assumption of parametric testing applies when comparing continuous data from two independent groups, the outcome variable should come from a population with a normal (Gaussian) distribution (Leedy & Ormrod, 2001). The accuracy of parametric testing is dependent on a Gaussian bell-shaped distribution. Two $JMP_{6.0}$®

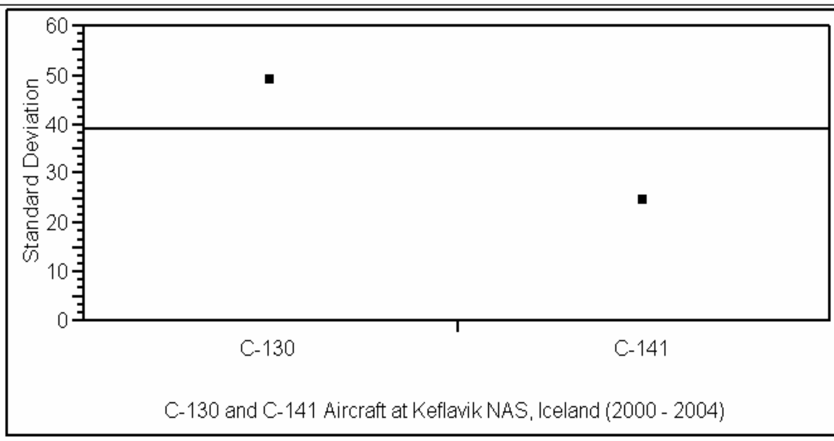
tools were employed to test the data sets for Gaussian distributions. The first tool used to determine the population's distribution was a standard histogram.

The second tool used to determine normal distribution was the application of a goodness-of-fit test, which provided a p-value based on the type of test used. For data populations with less than 2000 data points, a Shapiro-Wilk (W-statistic) test was used and for populations with greater than 2000 data points, the Kolmogorov-Smirnoff-Lillifors (KLS) (D-statistic) test was applied (SAS Institute, 2005). Shapiro-Wilk (probability < W) and KLS (probability > D) test p-values greater than 0.05 indicate a normal distribution, while less than 0.05 indicated that the data points came from a non normal distribution (SAS Institute, 2005).

In cases where the goodness-of-fit test resulted in slight or significant indications of non normal distribution, a test for lognormal distribution was applied. Data that are positively skewed to the right may still produce a Gaussian distribution result when the natural logarithm is used (Microsoft ® Corporation, 2001). Kolmogorov's D-test was used for goodness-of-fit test for lognormal distributions and the p-values (probability > D) results greater than 0.05 indicated a lognormal distribution and less than 0.05 indicated a non-lognormal distribution (SAS Institute, 2005).

The third assumption of parametric testing requires the populations from which the data samples are drawn have equal variances (Microsoft ® Corporation, 2001). To determine if the variance of two data sets were equal, a standard two-tailed *F*-test for equal variance was performed in $JMP_{6.0}$® (SAS Institute, 2005). The data analysis sample depicted in Table 4 provides a data source for the test for equal variance presented in Figure 12. The resulting p-value of 0.0051 (circled) was < 0.05, which indicated a significant level of difference in variance, thus suggesting nonparametric testing of these data sets may yield more reliable results (SAS Institute, 2005).

Figure 12. Sample Test for Unequal Variance



Level	Count	Standard Deviation	Mean Absolute Difference to Mean	Mean Absolute Difference to Median
C-130	20	48.77404	40.68400	39.51000
C-141	18	24.05908	19.19074	18.11667

Test	F Ratio	Degrees of Freedom (Numerator)	Degrees of Freedom (Denominator)	p-Value
F Test 2-sided	4.1098	19	17	**0.0051**

(SAS Institute, 2005).

Parametric and Nonparametric Testing. As discussed previously, both parametric and nonparametric testing was used to determine if significant differences existed between data groups. The unpaired two-sample Student's t-test assuming unequal variance was used based on the large sample populations being analyzed. The p-value for the t-test is the absolute t-value (probability > |t|).

The data sets used in this research did not conform to normal or lognormal distributions. Nonparametric tests such as the Mann-Whitney Test (also known as rank sum test) were also used to compare unpaired data sets. $JMP_{6.0}$® software considers the

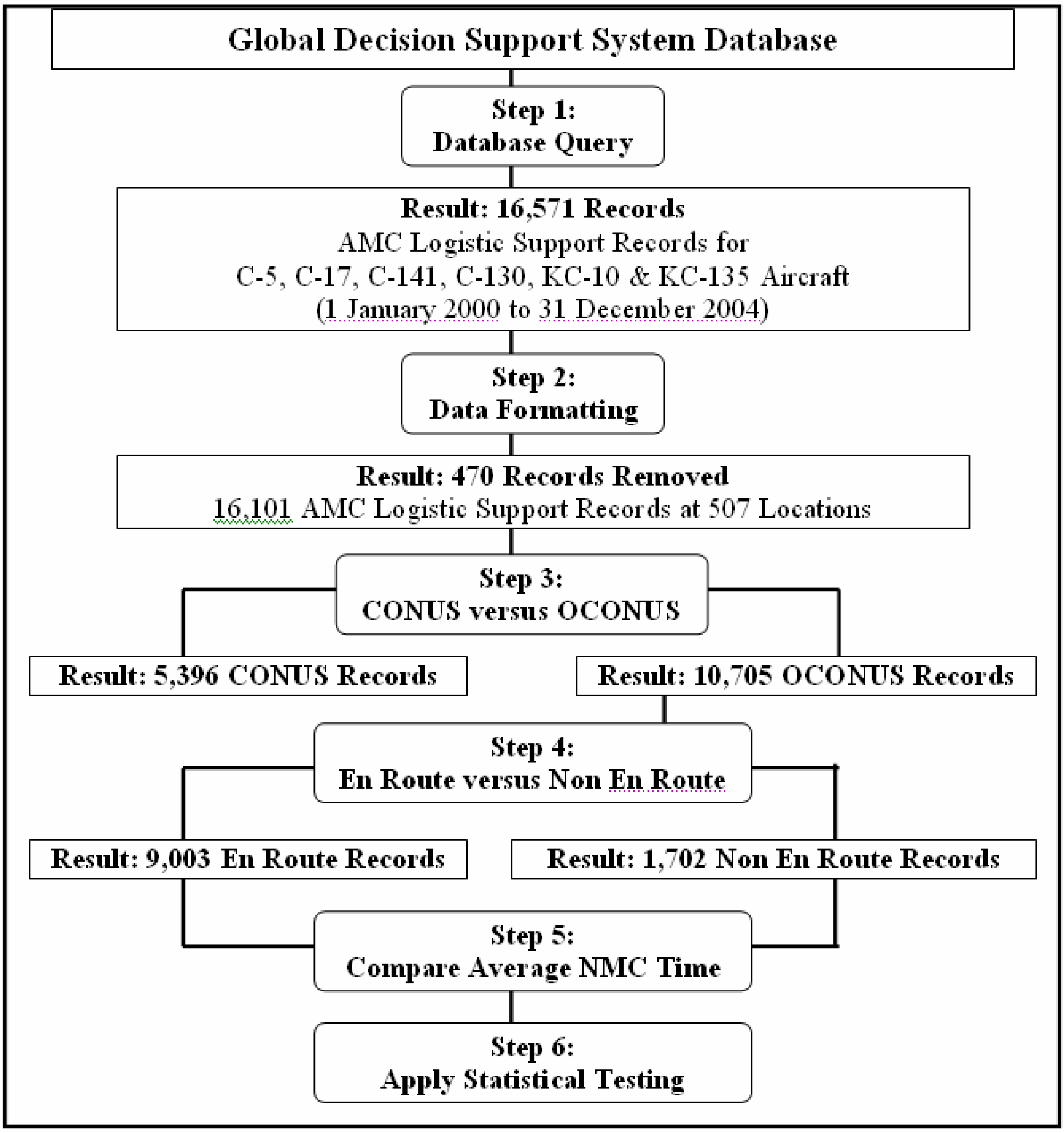
Wilcoxon two-sample test and the Mann-Whitney test equivalent (SAS Institute, 2005). The p-value for the two-sample Wilcoxon test is found in the absolute value of Z (probability > |Z|) (SAS Institute, 2005).

In either parametric or nonparametric testing, the resulting p-value indicates the amount of whether there is statistical evidence that the two average NMC times are different (SAS Institute, 2005). If the p-value is equal to or greater than 0.05, then there is no indication of difference between the data set means (i.e. en route and non en route provide the same average NMC time). For a p-value slightly less than 0.05, a possible difference may exist between the groups or there may be some level of "noise", depending on the variance in the data sets. If the p-value is significantly less than 0.05, there is indication that the means of the data sets are different (i.e. either en route or non en routes locations have a significantly lower average NMC time).

Summary

This methodology discussed how the raw data from the GDSS database was collected and prepared for analysis. Average NMC time calculations provide the baseline measurement for the data analysis and the comparative statistical testing conducted in this research. The data analysis categorized the data and provided a summary of logistic supports by geographic location and aircraft MDS. A discussion of the statistical testing procedures used in this research was presented. A thesis methodology outline is presented in Figure 13 and the results of this study are discussed in the next chapter.

Figure 13. Thesis Methodology Outline



Data derived from the *Global Decision Support System* (AMC, 2002b), *Microsoft® Excel2002* (Microsoft® Corporation, 2001), and *JMP (Version 6.0), The Statistical Discovery Software* (SAS Institute, 2005).

Results

Preface

The results of the data analysis are presented in this chapter. The results specific to the main research question and the six sub-questions will be discussed first followed by a discussion of the supplemental exploratory analyses on the overall AMC logistic support effort during the 2000 – 2004 timeframe. The supplemental data also depicted the level of detail and comparison capabilities provided by the AMC off-station logistic support model.

Research Questions

The question central to this study is the effectiveness of the AMC en route support infrastructure from an en route versus non en route perspective. The results presented in this section are critical to assessing effectiveness of the en route locations in reducing mission delays due to aircraft maintenance problems. The initial analysis began at a macro level, and then progressed to a more detailed analysis of each MDS performance.

Background. As stated in the data collection section of the literature review, a total of 16,101 AMC logistic support records were analyzed in this study. Of those records, 33.5% of the support efforts occurred at CONUS locations. The remaining supports occurred at OCONUS locations and were further divided into 10.6% at non en route locations and 55.9% at AMC en route locations. All AMC logistic support record categories included in this research are presented in Table 5. The shaded rows highlight the data used to answer the main research question.

Table 5. AMC Logistic Supports (2000 - 2004)

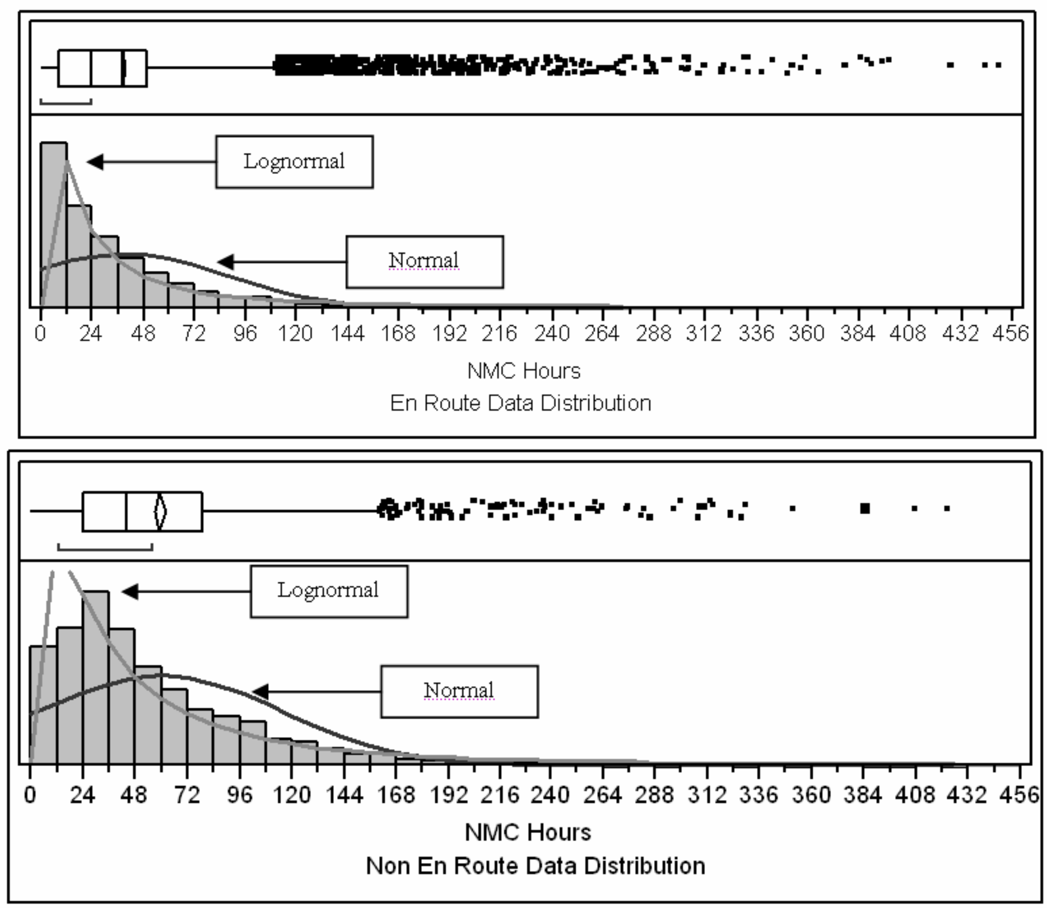
Fleet (MDS)	En Route Location	Number of Logistic Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
CONUS	**N**	5396	160449	29.7	21.0	0.1	413.8	413.7	34.4	1180.7	0.05	0.9	28.8	30.6
OCONUS	**N**	**1702**	**101414**	**59.6**	**44.5**	**0.1**	**422.8**	**422.7**	**55.2**	**3048.9**	**0.05**	**2.6**	**57.0**	**62.2**
	Y	**9003**	**347874**	**38.6**	**23.4**	**0.1**	**449.5**	**449.4**	**47.1**	**2216.7**	**0.05**	**1.0**	**37.6**	**39.6**
	Total	10705	449288	42.0	26.2	0.1	449.5	449.4	49.1	2407.4	0.05	0.9	41.1	42.9
AMC Totals		**16101**	609737	37.9	23.8	0.1	449.5	449.4	45.0	2029.4	0.05	0.7	37.2	38.6

Data derived from the *Global Decision Support System* (AMC, 2002b), *Microsoft® Excel 2002* (Microsoft® Corporation, 2001), and JMP$_{6.0}$®, *The Statistical Discovery Software* (SAS Institute, 2005).

Research Question 1. The central question to this research effort was whether the C^3, logistics, and aerial port functions provided by the AMC OCONUS en route locations minimize mission delays due to aircraft maintenance. To answer this question, the average NMC time was calculated and compared between en route and non en route locations. As shown in the OCONUS section of Table 5, the average NMC time for OCONUS non en route location was 59.6 hours. Comparatively, the average NMC time at the AMC en route location was 38.6 hours. The resulting difference in average NMC time was 21.0 hours, however this simple calculation is insufficient in determining if there is significant difference between en route and non en route mean NMC times.

Further investigation of the results was conducted in accordance with the procedures outlined in the methodology, beginning with a test for normal distribution. The data distributions for the en route and non en route data sets are presented in Figure 14a. The indication lines for the normal and lognormal curves are labeled. The results of the goodness-of-fitness test for en route and non en route data distributions are presented in Table 6. The p-values for the goodness-of fit tests indicate that the en route and non en route data does not conform to a normal or a lognormal distribution (SAS Institute, 2005).

Figure 14a. OCONUS En Route / Non En Route Data Distributions



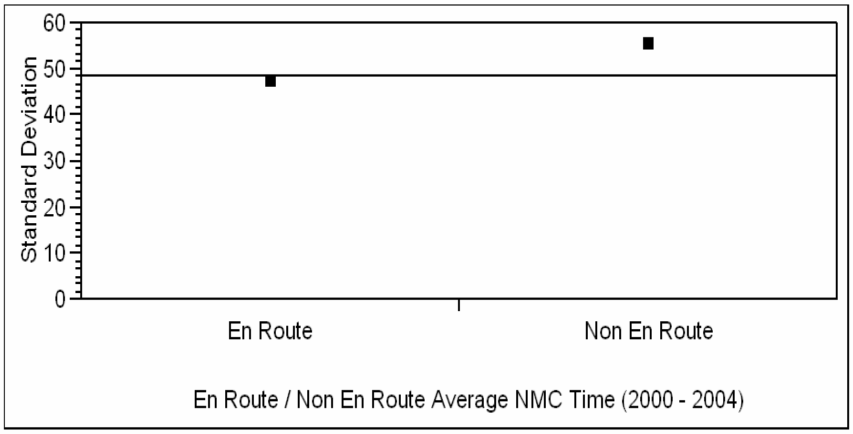
(SAS Institute, 2005).

Table 6. OCONUS En Route / Non En Route Data Distributions						
En Route Data - Fitted Normal Parameter Estimates					**Goodness-of-Fit Test** (KSL > 2000 Data Points)	
Type	Parameter	Estimate	Lower 95%	Upper 95%	D Statistic	Probability > D
Location	μ	38.63982	37.667142	39.612498	0.206517	P-value **< 0.0100**
Dispersion	σ	47.082134	46.404381	47.78012		
En Route Data - Fitted LogNormal Parameter Estimates					**Goodness-of-Fit Test** (Kolmogorov's D)	
Type	Parameter	Estimate	Lower 95%	Upper 95%	D Statistic	Probability > D
Scale	μ	2.9497095	2.9215964	2.9778226	0.070723	P-value **< 0.0100**
Shape	σ	1.3609629	1.3413237	1.3810861		
Non En Route Data - Fitted Normal Parameter Estimates					**Goodness-of-Fit Test** (Shapiro-Wilk W < 2000 Data Points)	
Type	Parameter	Estimate	Lower 95%	Upper 95%	W Statistic	Probability < W
Location	μ	59.585076	56.959976	62.210177	0.805939	P-value **0.0000**
Dispersion	σ	55.216444	53.421879	57.136677		
Non En Route Data - Fitted LogNormal Parameter Estimates					**Goodness-of-Fit Test** (Kolmogorov's D)	
Type	Parameter	Estimate	Lower 95%	Upper 95%	D Statistic	Probability > D
Scale	μ	3.6276801	3.5735199	3.6818403	0.101305	P-value **< 0.0100**
Shape	σ	1.1399984	1.1027483	1.1793938		
(SAS Institute, 2005).						

The next step in evaluating the data comprised a test for equal variance between OCONUS en route and non en route data sets. The results of the two-sided F-test are depicted in Figure 17b. The resulting p-value of < 0.0001 (circled) was less than 0.05, which indicated the variance between en route and non en route data groups was significantly different (i.e. unequal) (SAS Institute, 2005).

The final steps of data evaluation incorporated parametric and nonparametric testing determined if there was a statistically significant difference between the OCONUS en route and non en route data sets. The unpaired two-sample Student's t-test assuming unequal variance was used to compare the means of the data sets. The resulting p-value of < 0.0001 (probability > |t| = 1.43e^{-46}) indicated significant difference between the means of the en route and non en route data sets. The parametric t-test results are presented in Figure 17c.

Figure 14b. OCONUS En Route / Non En Route Data F-Test Results



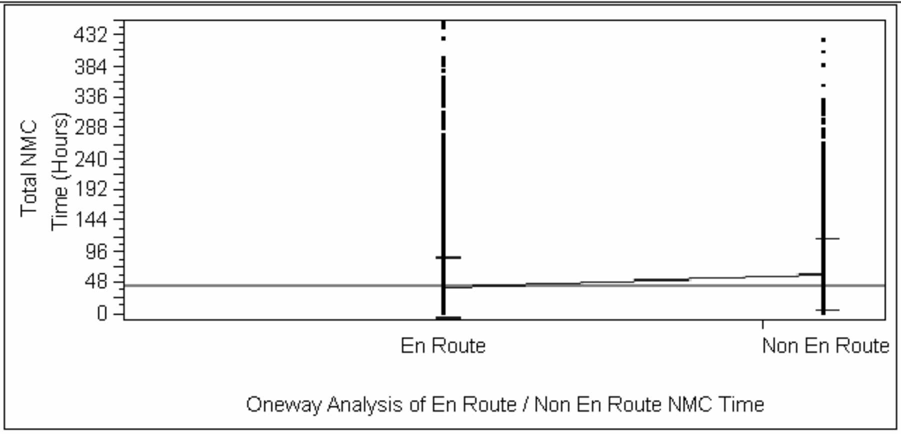
Level	Count	Standard Deviation	Mean Absolute Difference to Mean	Mean Absolute Difference to Median
En Route	9003	47.08213	31.67688	28.85975
Non En Route	1702	55.21644	39.34113	36.90952

Test	F Ratio	Degrees of Freedom (Numerator)	Degrees of Freedom (Denominator)	p-Value
F Test 2-sided	1.3754	1701	9002	**<.0001 (9.39e-19)**

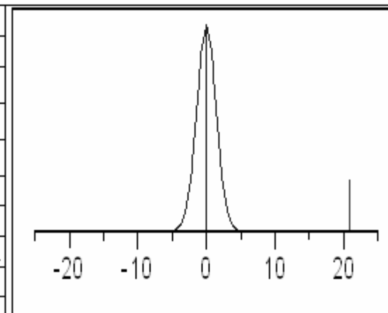
(SAS Institute, 2005).

The Mann-Whitney (Wilcoxon) test was used to compare the sum of ranks for two unpaired data groups. This test was specifically applied due to the non-normal distribution and unequal variance results obtained in the previous applications. The resulting p-value of < 0.0000 (probability > |Z| = 0.0) indicated significant difference between the ranked sums of the en route and non en route data sets. The nonparametric Mann-Whitney (Wilcoxon) test results are presented in Figure 17c. The results of the parametric and nonparametric tests provided corroborating evidence supporting a significant difference exists between the en route and non en route data groups.

Figure 14c. OCONUS En Route / Non En Route Data Testing Results



Two-sample Unpaired t-Test Assuming Unequal Variances (Parametric)	
Difference	20.9453
Standard Error Difference	1.4274
Upper Confidence Level Difference	23.7445
Lower Confidence Level Difference	18.1460
Confidence	0.95
t Ratio	14.6734
Degrees of Freedom	2192.916
Probability > |t|	**p-value <.0001**
Probability > t	<.0001
Probability < t	1.0000



Mann-Whitney (Wilcoxon) Tests (Rank Sums) (Nonparametric)					**2-SampleTest, Normal Approximation**		
Level	Count	Score Sum	Score Mean	(Mean-Mean 0) / Standard 0	S Statistic	Z Statistic	Probability >|Z|
En Route	9003	4.58e+7	5082.11	-20.859	11549620	20.85859	P-value **0.0000**
Non En Route	1702	1.15e+7	6785.91	20.859			

(SAS Institute, 2005)

To estimate how different the average NMC times are, a comparison of the lower confidence limit (LCL) of the non-en route time to the upper confidence level (UCL) of the en route time was conducted. The en route UCL (39.6 hours) was subtracted from the non en route LCL (57.0 hours) resulting in a difference in average NMC time of 17.4 hours. This result can be interpreted as the lower bound of estimated savings in average NMC time at en route locations.

To summarize research question 1, there is significant difference in average NMC time indicating that the AMC OCONUS en route support infrastructure reduces mission delays due to aircraft maintenance problems.

MDS Specific Results. This section addresses research questions 1a – 1f and uses the results provided in Table 7 to identify the differences between AMC en route and non en route locations based on individual MDS performance.

Table 7. En Route Versus Non En Route by MDS (2000 – 2004)

Fleet (MDS)	En Route Location	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
C-5	**N**	349	18653.5	53.5	38.0	0.5	330.0	329.5	52.9	2794.3	0.05	5.6	47.9	59.0
	Y	4084	144929.6	35.5	20.4	0.1	443.5	443.4	45.9	2103.2	0.05	1.4	34.1	36.9
C-17	**N**	364	18926.4	52.0	37.1	0.1	322.5	322.4	48.7	2367.6	0.05	5.0	47.0	57.0
	Y	2135	72643.5	34.0	21.2	0.1	332.3	332.2	40.8	1664.6	0.05	1.7	32.3	35.8
C-141	**N**	280	17658.4	63.1	47.3	0.2	407.5	407.3	56.0	3140.0	0.05	6.6	56.5	69.6
	Y	1209	45075.5	37.3	23.0	0.2	449.5	449.3	44.6	1990.5	0.05	2.5	34.8	39.8
C-130	**N**	438	28116.0	64.2	47.9	0.3	422.8	422.5	56.3	3168.0	0.05	5.3	58.9	69.5
	Y	215	10759.8	50.1	37.2	0.1	287.5	287.4	48.7	2372.8	0.05	6.5	43.5	56.6
KC-10	**N**	156	11376.2	72.9	55.7	0.2	385.1	384.9	65.8	4332.6	0.05	10.3	62.6	83.2
	Y	642	32116.3	50.0	32.5	0.1	395.3	395.2	54.1	2925.8	0.05	4.2	45.8	54.2
KC-135	**N**	115	6683.3	58.1	46.0	0.8	327.8	327.0	53.7	2883.8	0.05	9.8	48.3	67.9
	Y	718	42349.6	59.0	43.8	0.1	385.3	385.2	59.2	3509.3	0.05	4.3	54.6	63.3
TOTALS		10705	449288.1	42.0	26.2	0.1	449.5	449.4	49.1	2407.4	0.05	0.9	41.1	42.9

Data derived from the *Global Decision Support System* (AMC, 2002b), *Microsoft® Excel 2002* (Microsoft® Corporation, 2001), and JMP$_{6.0}$®, *The Statistical Discovery Software* (SAS Institute, 2005).

Research Question 1a (C-5 Aircraft). To answer this question, the average C-5 NMC time was calculated and compared between en route and non en route locations. As shown in the C-5 section of Table 7, the average C-5 NMC time for OCONUS non en route locations was 53.5 hours. Comparatively, the average NMC time at the AMC en route locations was 35.5 hours. The resulting difference in average C-5 NMC time was 18.0 hours. The same steps used to test research question 1 were used to further evaluate this result. The ratio of C-5 en route to non en route logistic support was 11.7:1, indicating heavy reliance on the en route infrastructure. A summary of the statistical testing is provided below.

The p-value results of the goodness-of-fitness tests indicate that the en route and non en route C-5 data distributions did not conform to a normal or a lognormal distribution. The p-values for the goodness-of fit tests are presented in Table 8a (SAS Institute, 2005).

Table 8a. C-5 En Route / Non En Route Data Distribution Results

C-5 En Route Data			
Normal Goodness-of-Fit Test (KSL > 2000 Data Points)		**LogNormal Goodness-of-Fit Test** (Kolmogorov's D)	
D Statistic	Probability > D	D Statistic	Probability > D
0.220199	P-value **< 0.0100**	0.056518	P-value **< 0.0100**
C-5 Non En Route Data			
Normal Goodness-of-Fit Test (Shapiro-Wilk W < 2000 Data Points)		**LogNormal Goodness-of-Fit Test** (Kolmogorov's D)	
W Statistic	Probability < W	D Statistic	Probability > D
0.781766	P-value **0.0000**	0.080510	P-value **< 0.0100**
(SAS Institute, 2005).			

The results of the two-sided F-test for equal variance are depicted in Table 8b. The resulting p-value of 0.000143 was less than 0.05, which indicated the variance between en route and non en route C-5 data groups was significantly different (SAS Institute, 2005).

Table 8b. C-5 En Route / Non En Route F-Test Results				
Test	F Ratio	Degrees of Freedom (Numerator)	Degrees of Freedom (Denominator)	p-Value
F Test 2-sided	1.3321	348	4083	**0.000143**
(SAS Institute, 2005).				

Parametric and nonparametric testing was applied to determine if there was a statistically significant difference between the en route and non en route C-5 data sets. The unpaired two-sample Student's t-test assuming unequal variance was used to compare the means of the C-5 data sets. The resulting p-value of < 0.0001 (probability $>$ $|t| = 1.965e^{-9}$) indicated significant difference between the means of the en route and non en route C-5 data sets. The parametric t-test results are presented in Table 8c.

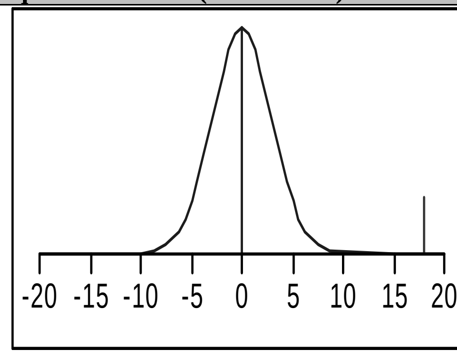
The Mann-Whitney (Wilcoxon) test was used to compare the sum of ranks for two unpaired data groups. This test was specifically applied due to the non-normal distribution and unequal variance results obtained in the previous applications. The resulting p-value of < 0.0000 (probability $> |Z| = 0.0$) indicated significant difference between the ranked sums of the en route and non en route C-5 data sets. The nonparametric Mann-Whitney (Wilcoxon) test results are presented in Table 8c. The results of the parametric and nonparametric tests provided corroborating evidence indicating a significant difference exists between the en route and non en route C-5 data.

To estimate how different the average C-5 NMC times are, a comparison of the lower confidence limit (LCL) of the C-5 non-en route time to the upper confidence level (UCL) of the C-5 en route time was conducted. The en route UCL (36.9 hours) was subtracted from the non en route LCL (47.9 hours) resulting in a difference in average

NMC time of 11.0 hours. This result can be interpreted as the lower bound of estimated savings in average C-5 NMC time at en route locations.

Table 8c. C-5 En Route / Non En Route Data Testing Results

Two-sample Unpaired t-Test Assuming Unequal Variances (Parametric)	
Difference	17.9613
Standard Error Difference	2.9231
Upper Confidence Level Difference	23.7082
Lower Confidence Level Difference	12.2143
Confidence	0.95
t Ratio	6.144492
Degrees of Freedom	393.9439
Probability > |t|	**p-value <.0001**
Probability > t	<.0001
Probability < t	1.0000



Mann-Whitney (Wilcoxon) Tests (Rank Sums) (Nonparametric)					2-SampleTest, Normal Approximation		
Level	Count	Score Sum	Score Mean	(Mean-Mean 0) / Standard 0	S Statistic	Z Statistic	Probability >|Z|
En Route	4084	8843907	2165.50	-9.165	984054.5	9.16482	P-value **0.0000**
Non En Route	349	984055	2819.64	9.165			

(SAS Institute, 2005)

To summarize research question 1a, there was a significant difference in average C-5 NMC time indicating that the AMC OCONUS en route support infrastructure reduced C-5 mission delays due to aircraft maintenance problems.

Research Question 1b (C-17 Aircraft). To answer this question, the average C-17 NMC time was calculated and compared between en route and non en route locations. As shown in the C-17 section of Table 7, the average C-17 NMC time for OCONUS non en route locations was 52.0 hours. Comparatively, the average NMC time at the AMC en route locations was 34.0 hours. The resulting difference in average C-17 NMC time was 18.0 hours. The ratio of C-17 en route to non en route logistic supports was 5.9:1, indicating moderate reliance on the en route infrastructure. A summary of the statistical testing is provided below.

The p-value results of the goodness-of-fitness tests indicate that the en route and non en route C-17 data distributions did not conform to a normal or a lognormal distribution. The p-values for the goodness-of fit tests are presented in Table 9a (SAS Institute, 2005).

Table 9a. C-17 En Route / Non En Route Data Distribution Results			
C-17 En Route Data			
Normal Goodness-of-Fit Test (KSL > 2000 Data Points)		**LogNormal Goodness-of-Fit Test** (Kolmogorov's D)	
D Statistic	Probability > D	D Statistic	Probability > D
0.202901	P-value < **0.0100**	0.071927	P-value < **0.0100**
C-17 Non En Route Data			
Normal Goodness-of-Fit Test (Shapiro-Wilk W < 2000 Data Points)		**LogNormal Goodness-of-Fit Test** (Kolmogorov's D)	
W Statistic	Probability < W	D Statistic	Probability > D
0.796327	P-value **0.0000**	0.121747	P-value < **0.0100**
(SAS Institute, 2005).			

The results of the two-sided F-test for equal variance are depicted in Table 9b. The resulting p-value of 0.000143 was less than 0.05, which indicated the variance between en route and non en route C-17 data groups was significantly different (SAS Institute, 2005).

Table 9b. C-17 En Route / Non En Route F-Test Results				
Test	F Ratio	Degrees of Freedom (Numerator)	Degrees of Freedom (Denominator)	p-Value
F Test 2-sided	1.4255	363	2134	< **0.0001**
(SAS Institute, 2005).				

Parametric and nonparametric testing was applied to determine if there was a statistically significant difference between the en route and non en route C-17 data sets. The unpaired two-sample Student's t-test assuming unequal variance was used to compare the means of the C-17 data sets. The resulting p-value of < 0.0001 (probability > |t| = 8.43e^{-11}) indicated significant difference between the means of the en route and non en route C-17 data sets. The parametric t-test results are presented in Table 9c.

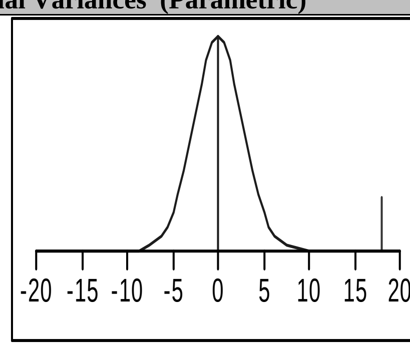
The Mann-Whitney (Wilcoxon) test was used to compare the sum of ranks for two unpaired data groups. This test was specifically applied due to the non-normal distribution and unequal variance results obtained in the previous applications. The resulting p-value of < 0.0000 (probability > |Z| = 0.0) indicated significant difference between the ranked sums of the en route and non en route C-17 data sets. The nonparametric Mann-Whitney (Wilcoxon) test results are presented in Table 9c. The results of the parametric and nonparametric tests provided corroborating evidence indicating a significant difference exists between the en route and non en route C-17 data.

To estimate how different the average C-17 NMC times are, a comparison of the lower confidence limit (LCL) of the C-17 non-en route time to the upper confidence level (UCL) of the C-17 en route time was conducted. The en route UCL (35.8 hours) was subtracted from the non en route LCL (47.0 hours) resulting in a difference in average NMC time of 11.2 hours. This result can be interpreted as the lower bound of estimated savings in average C-17 NMC time at en route locations.

Table 9c. C-17 En Route / Non En Route Data Testing Results

Two-sample Unpaired t-Test Assuming Unequal Variances (Parametric)

Difference	17.9705
Standard Error Difference	2.7023
Upper Confidence Level Difference	23.2811
Lower Confidence Level Difference	12.6600
Confidence	0.95
t Ratio	6.650143
Degrees of Freedom	453.9165
Probability > |t|	**p-value <.0001**
Probability > t	<.0001
Probability < t	1.0000



Mann-Whitney (Wilcoxon) Tests (Rank Sums) (Nonparametric)					2-SampleTest, Normal Approximation		
Level	Count	Score Sum	Score Mean	(Mean-Mean 0) / Standard 0	S Statistic	Z Statistic	Probability >|Z|
En Route	2135	2550077	1194.42	-9.327	573673.5	9.32669	P-value **0.0000**
Non En Route	364	573674	1576.03	9.327			

(SAS Institute, 2005)

To summarize research question 1b, there was a significant difference in average C-17 NMC time indicating that the AMC OCONUS en route support infrastructure reduced C-17 mission delays due to aircraft maintenance problems.

Research Question 1c (C-141 Aircraft). To answer this question, the average C-141 NMC time was calculated and compared between en route and non en route locations. As shown in the C-141 section of Table 7, the average C-141 NMC time for OCONUS non en route locations was 63.1 hours. Comparatively, the average NMC time at the AMC en route locations was 37.3 hours. The resulting difference in average C-141 NMC time was 18.0 hours. The ratio of C-141 en route to non en route logistic supports was 4.3:1, indicating moderate reliance on the en route infrastructure. A summary of the statistical testing is provided below.

The p-value results of the goodness-of-fitness tests indicate that the en route and non en route C-141 data distributions did not conform to a normal or a lognormal distribution. The p-values for the goodness-of fit tests are presented in Table 10a (SAS Institute, 2005).

Table 10a. C-141 En Route / Non En Route Data Distribution Results			
C-141 En Route Data			
Normal Goodness-of-Fit Test (Shapiro-Wilk W < 2000 Data Points)		**LogNormal Goodness-of-Fit Test** (Kolmogorov's D)	
W Statistic	Probability < W	D Statistic	Probability > D
0.716569	P-value **< 0.0000**	0.081370	P-value **< 0.0100**
C-141 Non En Route Data			
Normal Goodness-of-Fit Test (Shapiro-Wilk W < 2000 Data Points)		**LogNormal Goodness-of-Fit Test** (Kolmogorov's D)	
W Statistic	Probability < W	D Statistic	Probability > D
0.784342	P-value **0.0000**	0.123834	P-value **< 0.0100**
(SAS Institute, 2005).			

The results of the two-sided F-test for equal variance are depicted in Table 10b. The resulting p-value of < 0.0001 (2.775e^{-7}) was less than 0.05, which indicated the variance between en route and non en route C-141 data groups was significantly different (SAS Institute, 2005).

Table 10b. C-141 En Route / Non En Route F-Test Results				
Test	F Ratio	Degrees of Freedom (Numerator)	Degrees of Freedom (Denominator)	p-Value
F Test 2-sided	1.5831	279	1209	**<0.0001**
(SAS Institute, 2005).				

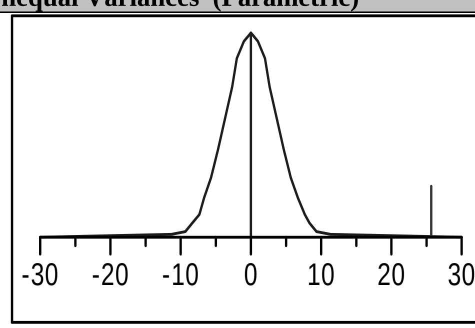
Parametric and nonparametric testing was applied to determine if there was a statistically significant difference between the en route and non en route C-141 data sets. The unpaired two-sample Student's t-test assuming unequal variance was used to compare the means of the C-141 data sets. The resulting p-value of < 0.0001 (probability > |t| = 3.95e^{-12}) indicated significant difference between the means of the en route and non en route C-141 data sets. The parametric t-test results are presented in Table 10c.

The Mann-Whitney (Wilcoxon) test was used to compare the sum of ranks for two unpaired data groups. This test was specifically applied due to the non-normal distribution and unequal variance results obtained in the previous applications. The resulting p-value of < 0.0000 (probability > |Z| = 0.0) indicated significant difference between the ranked sums of the en route and non en route C-141 data sets. The nonparametric Mann-Whitney (Wilcoxon) test results are presented in Table 10c. The results of the parametric and nonparametric tests provided corroborating evidence indicating a significant difference exists between the en route and non en route C-141 data.

To estimate how different the average C-141 NMC times are, a comparison of the lower confidence limit (LCL) of the C-141 non-en route time to the upper confidence level (UCL) of the C-141 en route time was conducted. The en route UCL (39.8 hours) was subtracted from the non en route LCL (56.5 hours) resulting in a difference in average NMC time of 16.7 hours. This result can be interpreted as the lower bound of estimated savings in average C-141 NMC time at en route locations.

Table 10c. C-141 En Route / Non En Route Data Testing Results

Two-sample Unpaired t-Test Assuming Unequal Variances (Parametric)	
Difference	25.7861
Standard Error Difference	3.5916
Upper Confidence Level Difference	32.8489
Lower Confidence Level Difference	18.7233
Confidence	0.95
t Ratio	7.179615
Degrees of Freedom	364.7272
Probability > |t|	**p-value <.0001**
Probability > t	<.0001
Probability < t	1.0000



Mann-Whitney (Wilcoxon) Tests (Rank Sums) (Nonparametric)					**2-SampleTest, Normal Approximation**		
Level	Count	Score Sum	Score Mean	(Mean-Mean 0) / Standard 0	S Statistic	Z Statistic	Probability >|Z|
En Route	1210	835772	690.721	-10.216	275023	10.21603	P-value **0.0000**
Non En Route	280	275023	982.225	10.216			

(SAS Institute, 2005)

To summarize research question 1c, there was a significant difference in average C-141 NMC time indicating that the AMC OCONUS en route support infrastructure reduced C-141 mission delays due to aircraft maintenance problems.

Research Question 1d (C-130 Aircraft). To answer this question, the average C-130 NMC time was calculated and compared between en route and non en route locations. As shown in the C-130 section of Table 7, the average C-130 NMC time for OCONUS non en route locations was 64.2 hours. Comparatively, the average NMC time at the AMC en route locations was 50.1 hours. The resulting difference in average C-130 NMC time was 14.1 hours. The ratio of C-130 non en route to en route logistic supports was 2:1, indicating no significant reliance on the en route infrastructure. A summary of the statistical testing is provided below.

The p-value results of the goodness-of-fitness tests indicate that the en route and non en route C-130 data distributions did not conform to a normal or a lognormal distribution. The p-values for the goodness-of fit tests are presented in Table 11a (SAS Institute, 2005).

Table 11a. C-130 En Route / Non En Route Data Distribution Results			
C-130 En Route Data			
Normal Goodness-of-Fit Test (Shapiro-Wilk W < 2000 Data Points)		**LogNormal Goodness-of-Fit Test** (Kolmogorov's D)	
W Statistic	Probability < W	D Statistic	Probability > D
0.716569	P-value **< 0.0001 (6.42e-14)**	0.113386	P-value **< 0.0100**
C-130 Non En Route Data			
Normal Goodness-of-Fit Test (Shapiro-Wilk W < 2000 Data Points)		**LogNormal Goodness-of-Fit Test** (Kolmogorov's D)	
W Statistic	Probability < W	D Statistic	Probability > D
0.840047	P-value **0.0000**	0.084939	P-value **< 0.0100**
(SAS Institute, 2005).			

The results of the two-sided F-test for equal variance are depicted in Table 11b. The resulting p-value of 0.017723 was less than 0.05, which indicated the variance between en route and non en route C-130 data groups was slightly different (SAS Institute, 2005).

Table 11b. C-130 En Route / Non En Route F-Test Results				
Test	F Ratio	Degrees of Freedom (Numerator)	Degrees of Freedom (Denominator)	p-Value
F Test 2-sided	1.3319	437	214	**0.0177**
(SAS Institute, 2005).				

Parametric and nonparametric testing was applied to determine if there was a statistically significant difference between the en route and non en route C-130 data sets. The unpaired two-sample Student's t-test assuming unequal variance was used to compare the means of the C-130 data sets. The resulting p-value of 0.001026 indicated significant difference between the means of the en route and non en route C-130 data sets. The parametric t-test results are presented in Table 11c.

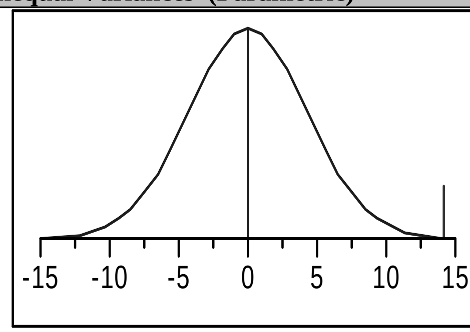
The Mann-Whitney (Wilcoxon) test was used to compare the sum of ranks for two unpaired data groups. This test was specifically applied due to the non-normal distribution and unequal variance results obtained in the previous applications. The resulting p-value of 0.000141 indicated significant difference between the ranked sums of the en route and non en route C-130 data sets. The nonparametric Mann-Whitney (Wilcoxon) test results are presented in Table 11c. The results of the parametric and nonparametric tests provided corroborating evidence indicating a significant difference exists between the en route and non en route C-130 data.

To estimate how different the average C-130 NMC times are, a comparison of the lower confidence limit (LCL) of the C-130 non-en route time to the upper confidence level (UCL) of the C-130 en route time was conducted. The en route UCL (56.6 hours) was subtracted from the non en route LCL (58.9 hours) resulting in a difference in average NMC time of 2.3 hours. This result can be interpreted as the lower bound of estimated savings in average C-130 NMC time at en route locations.

Table 11c. C-130 En Route / Non En Route Data Testing Results

Two-sample Unpaired t-Test Assuming Unequal Variances (Parametric)

Difference	14.1462
Standard Error Difference	4.2822
Upper Confidence Level Difference	22.5602
Lower Confidence Level Difference	5.7322
Confidence	0.95
t Ratio	3.30348
Degrees of Freedom	483.9905
Probability > |t|	**p-value 0.0010**
Probability > t	0.0005
Probability < t	1.0000



Mann-Whitney (Wilcoxon) Tests (Rank Sums) (Nonparametric)					**2-SampleTest, Normal Approximation**		
Level	Count	Score Sum	Score Mean	(Mean-Mean 0) / Standard 0	S Statistic	Z Statistic	Probability >|Z|
En Route	215	61681.0	286.888	-3.807	61681	-3.80655	P-value **0.0001**
Non En Route	438	151850	346.689	3.807			

(SAS Institute, 2005)

To summarize research question 1d, there was a significant difference in average C-130 NMC time indicating that the AMC OCONUS en route support infrastructure reduced C-130 mission delays due to aircraft maintenance problems. As discussed in the literature review, the AMC en route structure is not equipped or funded for C-130, KC-10, or KC-135 aircraft. Correspondingly, it appears as if the C-130 fleet does not rely on en route support to the extent of a C-5 or C-17. In fact, only one-third of OCONUS C-130 logistic supports occurred at an en route location.

Research Question 1e (KC-10 Aircraft). To answer this question, the average KC-10 NMC time was calculated and compared between en route and non en route locations. As shown in the KC-10 section of Table 7, the average KC-10 NMC time for OCONUS non en route locations was 72.9 hours. Comparatively, the average NMC time at the AMC en route locations was 50.0 hours. The resulting difference in average KC-10 NMC time was 22.9 hours. The ratio of KC-10 non en route to en route logistic supports was 4.1:1, indicating moderate reliance on the en route infrastructure. A summary of the statistical testing is provided below.

The p-value results of the goodness-of-fitness tests indicate that the en route and non en route KC-10 data distributions did not conform to a normal or a lognormal distribution. The p-values for the goodness-of fit tests are presented in Table 12a (SAS Institute, 2005).

Table 12a. KC-10 En Route / Non En Route Data Distribution Results

KC-10 En Route Data			
Normal Goodness-of-Fit Test (Shapiro-Wilk W < 2000 Data Points)		**LogNormal Goodness-of-Fit Test** (Kolmogorov's D)	
W Statistic	Probability < W	D Statistic	Probability > D
0.730140	P-value **0.0000**	0.121006	P-value **< 0.0100**
KC-10 Non En Route Data			
Normal Goodness-of-Fit Test (Shapiro-Wilk W < 2000 Data Points)		**LogNormal Goodness-of-Fit Test** (Kolmogorov's D)	
W Statistic	Probability < W	D Statistic	Probability > D
0.827234	P-value **< 0.0001 (2.72e-12)**	0.128131	P-value **< 0.0100**
(SAS Institute, 2005).			

The results of the two-sided F-test for equal variance are depicted in Table 12b. The resulting p-value of 0.001009 was less than 0.05, which indicated the variance of the en route and non en route KC-10 data groups was significantly different (SAS Institute, 2005).

Table 12b. KC-10 En Route / Non En Route F-Test Results				
Test	F Ratio	Degrees of Freedom (Numerator)	Degrees of Freedom (Denominator)	p-Value
F Test 2-sided	1.4881	155	641	**<0.001009**
(SAS Institute, 2005).				

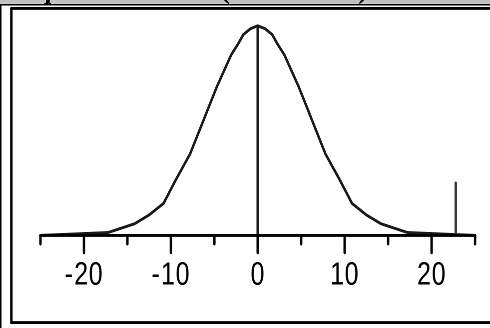
Parametric and nonparametric testing was applied to determine if there was a statistically significant difference between the en route and non en route KC-10 data sets. The unpaired two-sample Student's t-test assuming unequal variance was used to compare the means of the KC-10 data sets. The resulting p-value of < 0.0001 (probability > |t| = $8.271e^{-5}$) indicated significant difference between the means of the en route and non en route KC-10 data sets. The parametric t-test results are presented in Table 12c.

The Mann-Whitney (Wilcoxon) test was used to compare the sum of ranks for two unpaired data groups. This test was specifically applied due to the non-normal distribution and unequal variance results obtained in the previous applications. The resulting p-value of < 0.0001 (probability > |Z| = $1.799e^{-7}$) indicated significant difference between the ranked sums of the en route and non en route KC-10 data sets. The nonparametric Mann-Whitney (Wilcoxon) test results are presented in Table 12c. The results of the parametric and nonparametric tests provided corroborating evidence indicating a significant difference exists between the en route and non en route KC-10 data.

To estimate how different the average KC-10 NMC times are, a comparison of the lower confidence limit (LCL) of the KC-10 non-en route time to the upper confidence level (UCL) of the KC-10 en route time was conducted. The en route UCL (54.2 hours) was subtracted from the non en route LCL (62.6 hours) resulting in a difference in average NMC time of 8.4 hours. This result can be interpreted as the lower bound of estimated savings in average KC-10 NMC time at en route locations.

Table 12c. KC-10 En Route / Non En Route Data Testing Results

Two-sample Unpaired t-Test Assuming Unequal Variances (Parametric)	
Difference	22.8990
Standard Error Difference	5.7024
Upper Confidence Level Difference	34.1407
Lower Confidence Level Difference	11.6573
Confidence	0.95
t Ratio	4.0157
Degrees of Freedom	208.4101
Probability > |t|	**p-value < 0.0001**
Probability > t	< 0.0001
Probability < t	1.0000



Mann-Whitney (Wilcoxon) Tests (Rank Sums) (Nonparametric)					**2-SampleTest, Normal Approximation**		
Level	Count	Score Sum	Score Mean	(Mean-Mean 0) / Standard 0	S Statistic	Z Statistic	Probability >|Z|
En Route	642	243002	378.507	-5.219	75799.5	5.21896	P-value <**0.0001**
Non En Route	156	75799.5	485.894	5.219			

(SAS Institute, 2005)

To summarize research question 1e, there was significant difference in average KC-10 NMC time indicating that the AMC OCONUS en route support infrastructure reduced KC-10 mission delays due to aircraft maintenance problems. As discussed in the literature review, the AMC en route structure is not equipped or funded for C-130, KC-10, or KC-135 aircraft.

Research Question 1f (KC-135 Aircraft). To answer this question, the average KC-135 NMC time was calculated and compared between en route and non en route locations. As shown in the KC-135 section of Table 7, the average KC-135 NMC time for OCONUS non en route locations was 58.1 hours. Comparatively, the average NMC time at the AMC en route locations was 59.0 hours. The resulting difference in average

KC-135 NMC time was -0.9 hours. The ratio of KC-135 non en route to en route logistic supports was 6.2:1, indicating moderate reliance on the en route infrastructure. A summary of the statistical testing is provided below.

The p-value results of the goodness-of-fitness tests indicate that the en route and non en route KC-135 data distributions did not conform to a normal or a lognormal distribution. The p-values for the goodness-of fit tests are presented in Table 13a (SAS Institute, 2005).

Table 13a. KC-135 En Route / Non En Route Data Distribution Results

KC-135 En Route Data			
Normal Goodness-of-Fit Test (Shapiro-Wilk W < 2000 Data Points)		**LogNormal Goodness-of-Fit Test** (Kolmogorov's D)	
W Statistic	Probability < W	D Statistic	Probability > D
0.809544	P-value **0.0000**	0.097262	P-value < **0.0100**
KC-135 Non En Route Data			
Normal Goodness-of-Fit Test (Shapiro-Wilk W < 2000 Data Points)		**LogNormal Goodness-of-Fit Test** (Kolmogorov's D)	
W Statistic	Probability < W	D Statistic	Probability > D
0.776462	P-value **<0.0001 (6.06e-12)**	0.157504	P-value < **0.0100**
(SAS Institute, 2005).			

The results of the two-sided F-test for equal variance are depicted in Table 13b. The resulting p-value of 0.207828 was greater than 0.05, which indicated the en route and non en route KC-135 data groups had no evidence of unequal variance (SAS Institute, 2005).

Table 13b. KC-135 En Route / Non En Route F-Test Results

Test	F Ratio	Degrees of Freedom (Numerator)	Degrees of Freedom (Denominator)	p-Value
F Test 2-sided	1.2080	717	114	**0.2078**
(SAS Institute, 2005).				

Parametric and nonparametric testing was applied to determine if there was a statistically significant difference between the en route and non en route KC-135 data sets. The unpaired two-sample Student's t-test assuming unequal variance was used to compare the means of the KC-135 data sets. The resulting p-value of 0.8748 indicated no significant difference between the means of the en route and non en route KC-135 data sets. The parametric t-test results are presented in Table 13c.

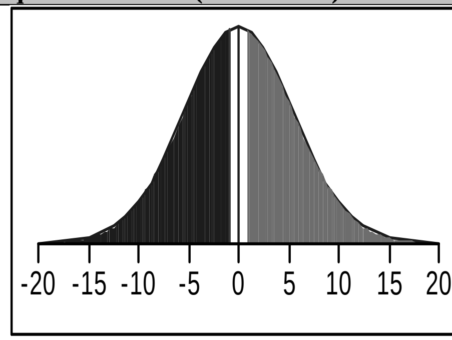
The Mann-Whitney (Wilcoxon) test was used to compare the sum of ranks for two unpaired data groups. This test was specifically applied due to the non-normal distribution and unequal variance results obtained in the previous applications. The resulting p-value of 0.4692 also indicated no significant difference between the ranked sums of the en route and non en route KC-135 data sets. The nonparametric Mann-Whitney (Wilcoxon) test results are presented in Table 13c. The results of the parametric and nonparametric tests failed to provide any evidence indicating a significant difference exists between the en route and non en route KC-135 data.

To estimate how different the average KC-135 NMC times are, a comparison of the lower confidence limit (LCL) of the KC-135 non-en route time to the upper confidence level (UCL) of the KC-135 en route time was conducted. The en route UCL (63.3 hours) was subtracted from the non en route LCL (48.3 hours) resulting in a difference in average NMC time of -15.0 hours. This result can be interpreted as no estimated savings in average KC-135 NMC time at en route locations.

Table 13c. KC-135 En Route / Non En Route Data Testing Results

Two-sample Unpaired t-Test Assuming Unequal Variances (Parametric)

Difference	-0.867
Standard Error Difference	5.495
Upper Confidence Level Difference	9.984
Lower Confidence Level Difference	-11.718
Confidence	0.95
t Ratio	-0.15781
Degrees of Freedom	161.4212
Probability > |t|	**p-value 0.8748**
Probability > t	0.5626
Probability < t	0.4374



Mann-Whitney (Wilcoxon) Tests (Rank Sums) (Nonparametric)					**2-SampleTest, Normal Approximation**		
Level	Count	Score Sum	Score Mean	(Mean-Mean 0) / Standard 0	S Statistic	Z Statistic	Probability >|Z|
En Route	718	297672	414.584	-0.724	49689.5	0.72385	P-value **0.4692**
Non En Route	115	49689.5	432.083	0.724			

(SAS Institute, 2005)

To summarize research question 1f, there was no significant difference in average KC-135 NMC time, indicating that the AMC OCONUS en route support infrastructure had no effect on reducing KC-135 mission delays due to aircraft maintenance problems. As discussed in the literature review, the AMC en route structure is not equipped or funded for C-130, KC-10, or KC-135 aircraft. However, unlike the KC-10 and C-130 fleets, the KC-135 fleet did not realize a reduction in average NMC time at AMC en route locations.

AMC Logistic Support Summary (2000 – 2004). The entire AMC logistic support effort performed by AMC/LRC over the 2000 - 2004 period is depicted in Figure 15. This data was divided into four main support categories; (a) CONUS, (b) OCONUS non en route, (c) OCONUS en route, and (d) totals supports. Each category was sub-divided by MDS and each entry displays three key pieces of logistic support data for that

MDS. The X-Axis represents the NMC hours and is broken into 12-hour increments. The gray diamond icon in each line represents the actual population mean. For example, the first entry displays the average NMC time for all C-5 CONUS supports (e.g. 32.6 hours). The black box icon on either side of the mean represent the estimated minimum and maximum average NMC hours based on the confidence interval provided by the data analysis.

CONUS Supports. The AMC CONUS supports returned the lowest average NMC times of the fours groups. There are many possible factors contributing to this; primarily the ability of the LRC to task for overland supports where the MRT could drive to the support location. An example of this would be a MRT tasked from Charleston AFB, South Carolina, driving to Pope AFB, North Carolina to repair a C-17 aircraft (AMC, 2002b). Another factor is the amount of CONUS airlift available to move the support packages. Additionally, overnight shipping provided be commercial services such as Fed Ex® or DHL® can greatly reduce the transportation times for MICAP parts. All CONUS supports, regardless of MDS, were completed within an average of 36 hours during this period.

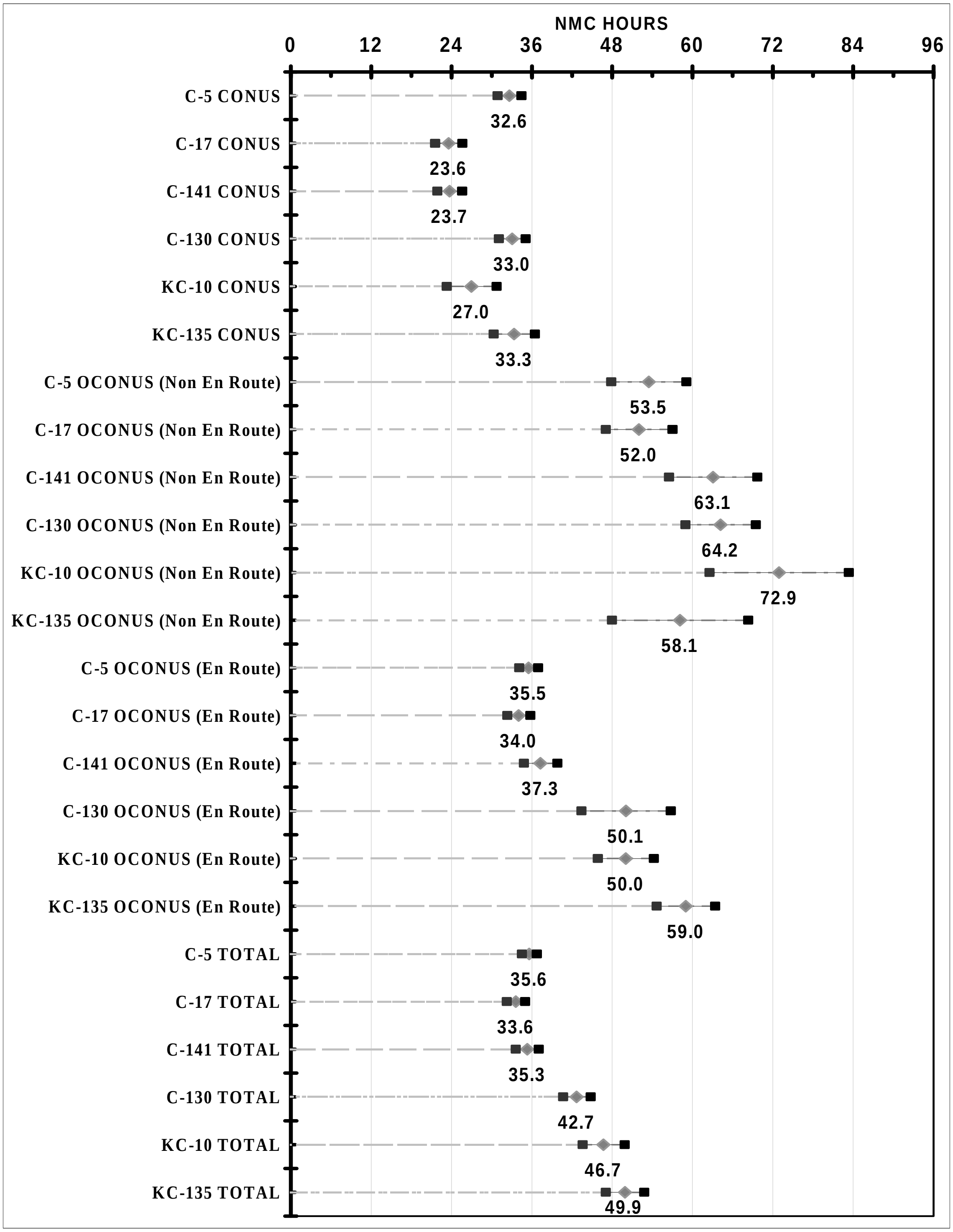
OCONUS Non En Route Supports. As expected, the OCONUS logistic supports to non en route locations represent the highest average NMC time of all the groups. In addition to higher average NMC times, each MDS also had a higher level of variance. Figure 15 shows wider gaps between the LCL and UCL for each MDS supported at non en route locations. The larger confidence level range could be an indication of increased variability or randomness (Microsoft® Corporation, 2001). The OCONUS supports to non en route were the most challenging efforts for AMC/LRC due to the lack of communications available at some locations and in-transit shipment visibility (AMC, 2002b).

OCONUS En Route Supports. The OCONUS en route supports are the focus of this research and provide the best assessment of how effective the AMC en route structure performs in reducing NMC time due to aircraft maintenance. The results depicted in Figure 15 indicate that the en route support locations on the average do not repair aircraft as quickly as CONUS support locations. This was not unexpected due to the challenges of the logistics pipeline and the increased transportation times. The effectiveness of the en route locations in reducing NMC time was evident when compared to the non en route locations. When comparing these two groups, the en route locations had a substantially lower average NMC time. Each MDS showed, on the average, approximately 15 hours lower average NMC time at an en route location. The only exception to this was the KC-135 fleet, which had a 0.86 longer average NMC time. In addition to lower average NMC times, all MDS' had a narrower gap between the LCL and UCL. This may indicate that the AMC en routes affect the variability or randomness of the logistic supports (Microsoft® Corporation, 2001).

Total Supports. The total support group gives an overall average for supporting a specific MDS at any location. As expected, this data falls between the CONUS and OCONUS support range. This information is helpful in determining the difference between en route support performance and the overall support effort for each MDS.

The results of the data analysis indicate that en route locations reduce mission delays due to aircraft maintenance problems and may provide a level of stability to the logistic support process, which is lacking at the non en route locations.

Figure 15. Comparison of AMC Logistic Supports (2000 -2004)



Data derived from the *Global Decision Support System* (AMC, 2002b), *Microsoft® Excel 2002* (Microsoft® Corporation, 2001), and JMP$_{6.0}$®, *The Statistical Discovery Software* (SAS Institute, 2005).

Summary

This chapter provided a summary of the results from analysis performed on 16,101 GDSS logistic support records. The results for the primary research question were presented and evidence indicates that the overall AMC en route support structure does reduce mission delays due to aircraft maintenance problems based on the average NMC time calculation and statistical testing. The results for the MDS related research questions shows that the en route structure is effective at reducing aircraft maintenance related delays for the funded airlift fleets (C-5, C-17, and C-141), as well as the C-130 and KC-10 fleets. The results of the statistical testing indicate that the KC-135 fleet did not experience significant reductions in average NMC time at en route locations. In fact, the evidence suggests that the KC-135 fleet does not benefit from the AMC en route structure in terms of reduced NMC time. The next chapter will present discussion on these results and provide recommendations.

Discussion

Preface

The purpose of this chapter is to provide discussion on how the results of this study influences the research objective of this thesis. This discussion opens by comparing the results obtained in the results chapter with the central question of the effectiveness of en route versus non en route OCONUS logistic support locations. The discussion continues by looking at recommendations on how the data analysis can be employed by AMC/A4 and TACC to monitor logistic support records and how to apply the information provided followed by suggestions for future research related to this study. This chapter ends with the conclusions drawn from this research.

En Route versus Non En Route Locations

AMC has invested substantial amount of manpower, equipment, and funding into the en route support structure with the expectation that the services provided by the en route location will significantly reduce mission delays. The primary services discussed in the literature review are C^3, aerial port and aircraft maintenance functions. The results for research question compared the en route and non en route location data to determine if there was a significant difference in the two data groups. The significant difference in average NMC time indicated that the AMC OCONUS en route support infrastructure reduces mission delays due to aircraft maintenance problems. The minimum estimated savings in average NMC time between en route and non en route locations was calculated as 17.4 hours.

MDS Comparisons. A summary of the results of the en route versus non en route by MDS comparisons are presented in Table 14.

Table 14. MDS Comparison Results

MDS	Distribution	Variance	t-Test	Mann-Whitney Test	Conclusion
C-5	Non Normal Non LogNormal	Significant Difference	Significant Difference between Means	Significant Difference between Ranked Sums	En Routes Reduced Average NMC Time
C-17	Non Normal Non LogNormal	Significant Difference	Significant Difference between Means	Significant Difference between Ranked Sums	En Routes Reduced Average NMC Time
C-141	Non Normal Non LogNormal	Significant Difference	Significant Difference between Means	Significant Difference between Ranked Sums	En Routes Reduced Average NMC Time
C-130	Non Normal Non LogNormal	Slight Difference	Significant Difference between Means	Significant Difference between Ranked Sums	En Routes Slightly Reduced Average NMC Time
KC-10	Non Normal Non LogNormal	Significant Difference	Significant Difference between Means	Significant Difference between Ranked Sums	En Routes Reduced Average NMC Time
KC-135	Non Normal Non LogNormal	No Difference	No Difference between Means	No Difference between Ranked Sums	En Routes Did Not Reduce Average NMC Time

(SAS Institute, 2005).

Recommendations

This research effort indicated that AMC en route effectiveness in reducing mission delays due to aircraft maintenance during the 2000-2004 period was considerably better than the non en route locations. The following recommendations for action may further improve effectiveness.

AMC Logistic Support Data Analysis. The first recommendation is the implementation of the AMC logistic support data analysis tool created in $JMP_{6.0}$® to provide decision-making information for the TACC mission managers and AMC/A4. The mission managers in TACC reset crew duty schedules based on delays encounters during the missions. With the information provided by the analysis tool, TACC and the affected aircrews will have a better estimate of the time required to repair an aircraft discrepancy at a certain location. This information is essential for making decisions affecting mission changes, aircrew schedule return times (SRT), or an aircraft tail-swap.

The analysis tool can be expanded to incorporate logistic support records prior to 1 January 2000 and can be amended with new data. The tool can be set up to query directly from the GDSS database at scheduled intervals (e.g. monthly or annually), thus keeping the information current and allowing real-time assessments (AMC, 2002b). Additionally, the data is easily adapted to a web-based application, allowing multiple users access to the most current logistic support data.

In addition to expanding AMC logistic support data, both PACAF and AFSOC use GDSS to track and record each of there C-130 and KC-135 aircraft logistic supports (AMC, 2002b). This data can easily be incorporated into the analysis tool, offering two specific advantages. One benefit would be the increased C-130 and KC-135 data population size, which may aid in further research tailored to understanding logistic support considerations for aging aircraft fleets. Another benefit is the addition of geographic locations not captured by this study, essentially expanding the data analysis baseline. The resulting information could be shared among the major commands and possibly result in streamlined logistic support processes for certain locations.

Latin American En Route Location. The second recommendation is the establishment of an AMC en route location in the Latin American theater. During the comparison of the regional data captured by the analysis, a striking difference between the South American region (USSOUTHCOM) and all other regions was evident. The USSOUTHCOM region averaged 70.3 NMC hours per support, nearly 15 hours longer than the next highest region. With the closure of Howard AB, Panama, the Central and South American regions were left without a permanent AMC en route location. Although the significantly lower number of AMC logistic supports in this region shows a relatively small airflow, ongoing operations in this region coupled with potential hostile actions by Columbia or Venezuela present a scenario requiring a prolonged U.S. military presence. Establishing a suitable location for Latin American en route operations should be conducted to promote proactive decision-making versus reactive responses experienced during the open salvoes of Operation ENDURING FREEDOM. The establishment of a secure and well-suited en route location could pay huge dividends.

Future Research

This research established a baseline for measuring the effectiveness of the AMC logistic support process. The supplemental information provided in this section is designed to give a more detailed picture of the AMC logistic support process during the 2000 – 2004 period. Five areas of further investigation are provided; (a) a regional comparison, (b) a comparative MDS analysis, (c) a Pacific versus European en route comparison, (d) a detailed logistic support data analysis, and (e) a KC-135 fleet study.

Regional Comparison. This analysis corresponds directly to the recommendation of a Latin American en route location and provides the decision maker with a comparison of logistic supports by regions. The regions were divided into the geographic unified command areas of responsibility to parallel regional operations, such as OPERATION Iraqi Freedom. For example, prior to operations in Iraq, there was no GDSS data available to mission planners on logistic supports in Iraq (AMC, 2002b). By examining logistics supports prior to and during OPERATION Iraqi Freedom, AMC logistic managers can monitor the effect of supporting AMC aircraft at new location (e.g. Balad AB, Iraq). Information regarding regional AMC logistic supports and the Unified Command Map can be found in Appendix E, Table E1 and Figure E-1, respectively. The USSOUTHCOM average NMC time of 70.3 hours is significantly higher than any other region. Although there has been a relatively small of amount of supports in this region, the abnormally high average NMC time may be of interest to AMC/A4 and TACC/XOC.

Comparative MDS Analysis. The purpose of this comparison is to determine any significant differences between the airlift fleets and the C-130 and tanker fleets. As previously discussed, the AMC en route system is only funded and manned to provide support to C-5, C-17, and C-141 aircraft. This type of data analysis would allow AMC logisticians to determine if the funding investment does in fact, provide for reduced NMC time and if more resources should be dedicated to the en route C-130, KC-10, and KC-135 logistic support. A preliminary MDS analysis is provided in Appendix E, Table E2.

Pacific versus European En Route Comparison. The information presented in Appendix E, Table E3 compares the 715th AMOG (Pacific theater) to the 721st AMOG (European theater) in terms of average NMC time. Preliminary investigation revealed significant difference might exist between the two data sets. Further study into any statistical differences between the AMOGs may reveal dissimilar practices and provide lessons learned to improve the overall en route support infrastructure.

Detailed Logistic Support Analysis. The basic measure of average NMC time only provides a macro level indication of the effectiveness of the logistic support process. A study of the factors affecting supports, such as the type of aircraft maintenance discrepancy, the aircraft system affected, or the evaluation of cyclic or seasonal impact should be accomplished. Determining what aircraft components are causing the mission delays would provide valuable information to AMC logisticians investigating reliability and maintainability issues for the AMC fleet. A closer look at cyclic or seasonal effects may reveal trends, which the AMC leadership could predict and react. A simple example uncovered during this study was the significant increase in logistic support immediately following the new fiscal year. This increased occurred every October and was related to increased flying hours and missions (AMC, 2002b). Planners could compensate for this type of annual trend by temporarily increasing en route manning for a brief periods.

KC-135 Logistic Support. A closer examination of the en route effectiveness in supporting KC-135 aircraft should be undertaken. As highlighted in the literature review, the AMC en route system is not funded or equipped to support C-130, KC-10, and KC-135 aircraft. However, the results of this study indicate that both the C-130 and KC-10 fleet benefit, to some extent, from the services provided by en route support structure. The difference between the average NMC times for KC-135 aircraft at OCONUS en route and non en route is not significant (0.9 average hours) but may be worth investigating. One possible contributing factor may be the aging KC-135 fleet and with acquisition of the replacement tanker aircraft far on the horizon, improving logistic support for this force-enabling asset will continue to be a priority.

Conclusion

The results presented in this research establish a baseline for future studies into the effectiveness of the AMC OCONUS en route logistic support process and, in general, research regarding the off-station logistic support of AMC aircraft. The findings suggest that the AMC en route structure is effective in reducing mission delays due to aircraft maintenance problems. Additionally, the en route locations provide considerable reduction in NMC time per each MDS over the non en route locations. The only caveats to this statement are the KC-10 and KC-135 fleets, which were addressed in the previous section. It can be implied from these findings that AMC should continue its investment into the en route support structure and continue to monitor its effectiveness.

This study was sponsored by AMC/A49 (Logistics Operations Division) to provide an assessment of the AMC en route logistic support infrastructure and its effectiveness in reducing mission delays due to aircraft maintenance. The results of this research will benefit the offices of AMC/A4 and TACC/XOC in the analysis of logistic supports, identification of trends, and mission management.

Appendix A. Average Age of the AMC Fleet

Table A1. Average Age of the AMC Fleet

Age in Years (As of 30 Sept 2004)

		0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-24	24+	Total Aircraft	Average Age
C-5	Active Duty						43	7		23	73	21.7
	Air Force Reserve									32	32	33.1
	Air National Guard									13	13	33.2
C-17	Active Duty	42	33	20	19	4					118	5.1
	Air Force Reserve										0	
	Air National Guard	8									8	0.5
C-141	Active Duty										0	
	Air Force Reserve									20	20	37.9
	Air National Guard										0	
C-130	Active Duty	1			15	16	13	6		239	290	32.0
	Air Force Reserve	7	7	6	21	12	25	8	6	40	132	20.8
	Air National Guard	9	12	22	31	34	17	26	13	81	245	20.9
KC-10	Active Duty					1	11	30	17		59	19.7
	Air Force Reserve										0	
	Air National Guard										0	
KC-135	Active Duty									255	255	42.6
	Air Force Reserve									76	76	43.4
	Air National Guard									234	234	44.2
Total Aircraft		67	52	48	86	67	109	77	36	1013	1555	
Percent of AMC Fleet		4.3%	3.3%	3.1%	5.5%	4.3%	7.0%	5.0%	2.3%	65.1%		

Air Force Magazine, Journal of the Air Force Association (Mehuron, 2005).

Appendix B. AMC En Route Locations and Support Capabilities (2000 – 2004)

Table B1. AMC En Route Locations and Support Capabilities (2000 – 2004)

ICAO	En Route Location	Air Mobility Operations Group	Unit	Level of Support
PHIK	Hickam AFB, Hawaii	715 AMOG	715 AMOG HQ	HQ
PAEI	Eielson AFB, Alaska	715 AMOG	715 AMOG HQ / Operating Location - A	Limited
WSAP	Paya Lebar AB, Singapore	715 AMOG	715 AMOG HQ / Operating Location - D	Limited
NZCH	Christchurch IAP, New Zealand	715 AMOG	715 AMOG HQ / Operating Location - E	Limited
RJTY	Yokota AB, Japan	715 AMOG	730 Air Mobility Squadron	Major
FJDG	Diego Garcia NSF, BIOT	715 AMOG	730 Air Mobility Squadron, Det. 1	Limited
RKSO	Osan AB, South Korea	715 AMOG	731 Air Mobility Squadron	Limited
PAED	Elmendorf AFB, Alaska	715 AMOG	732 Air Mobility Squadron	Minor
RODN	Kadena AB, Okinawa	715 AMOG	733 Air Mobility Squadron	Minor
PGUA	Andersen AFB, Guam	715 AMOG	734 Air Mobility Squadron	Minor
PHIK	Hickam AFB, Hawaii	715 AMOG	735 Air Mobility Squadron	Major
YRSI	RAAF Richmond, Australia	715 AMOG	735 Air Mobility Squadron, Det. 1	Limited
ETAR	Ramstein AB, Germany	721 AMOG	721 AMOG HQ	HQ
OKBK	Kuwait IAP, Kuwait	721 AMOG	721 AMOG HQ / Det. 2	Limited
ORBD	Balad AB, Iraq	721 AMOG	721 AMOG HQ / Det. 5	Limited
LLBG	Ben Gurion IAP, Israel	721 AMOG	721 AMOG HQ / Operating Location - A	Limited
HECA	Cairo IAP, Egypt	721 AMOG	721 AMOG HQ / Operating Location - B	Limited
HECW	Cairo West AB, Egypt			
LICZ	Sigonella NAS, Italy	721 AMOG	721 AMOG HQ / Operating Location - C	Limited
ETAD	Spangdahlem AB, Germany	721 AMOG	721 AMOG HQ / Operating Location - D	Limited
ETAR	Ramstein AB, Germany	721 AMOG	723 Air Mobility Squadron	Major
LIPA	Aviano AB, Italy	721 AMOG	724 Air Mobility Squadron	Limited
LERT	Rota NS, Spain	721 AMOG	725 Air Mobility Squadron	Minor
EDDF	Rhein Main AB, Germany	721 AMOG	726 Air Mobility Squadron	Minor
EGUN	RAF Mildenhall, United Kingdom	721 AMOG	727 Air Mobility Squadron	Minor
LTAG	Incirlik AB, Turkey	721 AMOG	728 Air Mobility Squadron	Minor
LPLA	Lajes AB, Azores	721 AMOG	729 Air Mobility Squadron	Minor
LEMO	Moron AB, Spain	721 AMOG	4 Expeditionary Air Mobility Squadron	Limited
OEPS	Prince Sultan AB, Saudi Arabia	721 AMOG	8 Expeditionary Air Mobility Squadron	Limited
OTBH	Al Udeid AB, Qatar			

Derived from Air Mobility Command (AMC, 2003a), 715th Air Mobility Operations Group (2003), and 721st Air Mobility Operations Group (2003).

Appendix C. Logistic Support Locations by MDS (2000 -2004)

Table C1. C-5 Logistic Support Locations (2000 – 2004)

Location	Unit	MAJCOM	Level of Support for AMC
Robins AFB, GA	WR-OLC	AFMC	Depot
Dover AFB, DE	436th AW	AMC	Intermediate & Organizational
Travis AFB, CA	60th AMW	AMC	Intermediate & Organizational
Altus AFB, OK	97th AMW	AETC	Intermediate & Organizational
Lackland AFB, TX	433rd AW	AFRC	Intermediate & Organizational
Westover ARB, MA	439th AW	AFRC	Intermediate & Organizational
Stewart IAP, NY	105th AW	ANG	Intermediate & Organizational
OCONUS En Routes	715th / 721st AMOG	AMC	Varying levels of support
Data derived from multiple sources			

Table C2. C-17 Logistic Support Locations (2000 – 2004)

Location	Unit	MAJCOM	Level of Support for AMC
Boeing Aerospace Support Center (BASC), San Antonio, TX	Contractor	AFMC	Depot
Charleston AFB, SC	437th AW	AMC	Intermediate & Organizational
McChord AFB, WA	62nd AW	AMC	Intermediate & Organizational
McGuire AFB, NJ	305th AMW	AMC	Intermediate & Organizational
Altus AFB, OK	97th AMW	AETC	Intermediate & Organizational
Jackson ANGB, MS	172nd AW	ANG	Intermediate & Organizational
OCONUS En Routes	715th / 721st AMOG	AMC	Varying levels of support
Data derived from multiple sources			

Table C3. C-141 Logistic Support Locations (2000 – 2004)

Location	Unit	MAJCOM	Level of Support for AMC
Robins AFB, GA	WR-OLC	AFMC	Depot
Charleston AFB, SC	437th AW	AMC	Intermediate & Organizational
McChord AFB, WA	62nd AW	AMC	Intermediate & Organizational
McGuire AFB, NJ	305th AMW	AMC	Intermediate & Organizational
Altus AFB, OK	97th AMW	AETC	Intermediate & Organizational
Andrews AFB, MD	459th AW	AFRC	Intermediate & Organizational
March ARB, CA	452nd AMW	AFRC	Intermediate & Organizational
Wright-Patterson AFB, OH	445th AW	AFRC	Intermediate & Organizational
Jackson ANGB, MS	172nd AW	ANG	Intermediate & Organizational
Memphis ANGB, TN	164th AW	ANG	Intermediate & Organizational
OCONUS En Routes	715th / 721st AMOG	AMC	Varying levels of support
Data derived from multiple sources			

Table C4. C-130 Logistic Support Locations (2000 – 2004)

Location	Unit	MAJCOM	Level of Support for AMC
Robins AFB, GA	WR-OLC	AFMC	Depot
Pope AFB, NC	43rd AW	AMC	Intermediate & Organizational
Dyess AFB, TX	317th AG	AMC / ACC	Intermediate & Organizational
Little Rock AFB, AR	463rd AG / 314th AW	AMC / AETC	Intermediate & Organizational
Elmendorf AFB, AK	3rd Wing	PACAF	Intermediate & Organizational
Yokota AB, Japan	374th Wing	PACAF	Intermediate & Organizational
Ramstein AB, Germany	86th AW	USAFE	Intermediate & Organizational
Dobbins ARB, GA	94th AW	AFRC	Intermediate & Organizational
Keesler AFB, MS	403rd Wing	AFRC	Intermediate & Organizational
Maxwell AFB, AL	908th AW	AFRC	Intermediate & Organizational
Mitchell Field, WI	440th AW	AFRC	Intermediate & Organizational
Niagara Falls ARS, NY	914th AW	AFRC	Intermediate & Organizational
Peterson AFB, CO	302nd AW	AFRC	Intermediate & Organizational
Pittsburgh ARS, PA	911th AW	AFRC	Intermediate & Organizational
Willow Grove ARS, PA	913th AW	AFRC	Intermediate & Organizational
Youngstown ARS, OH	910th AW	AFRC	Intermediate & Organizational
Minneapolis-St. Paul ARS	934th AW / 133rd AW	AFRC / ANG	Intermediate & Organizational
Boise Air Terminal, ID	124th Wing	ANG	Intermediate & Organizational
Channel Islands ANGS, CA	146th AW	ANG	Intermediate & Organizational
Charlotte Airport, NC	145th AW	ANG	Intermediate & Organizational
Charleston-Yeager Airport, WV	130th AW	ANG	Intermediate & Organizational
Cheyenne MAP, WY	153rd AW	ANG	Intermediate & Organizational
Eastern West Virginia Airport, WV	167th AW	ANG	Intermediate & Organizational
Greater Peoria Airport, IL	182nd AW	ANG	Intermediate & Organizational
Hickam AFB, HI	154th Wing	ANG	Intermediate & Organizational
Kulis ANGB, AK	176th Wing	ANG	Intermediate & Organizational
Little Rock AFB, AR	189th AW	ANG	Intermediate & Organizational
Louisville IAP, KY	123rd AW	ANG	Intermediate & Organizational
Luis Munoz Marin Airport, PR	156th AW	ANG	Intermediate & Organizational
Mansfield Lahm Airport, OH	179th AW	ANG	Intermediate & Organizational
Martin State Airport, MD	175th Wing	ANG	Intermediate & Organizational
NAS JRB Fort Worth, TX	136th AW	ANG	Intermediate & Organizational
Nashville Airport, TN	118th AW	ANG	Intermediate & Organizational
New Castle County Airport, DE	166th AW	ANG	Intermediate & Organizational
Quonset State Airport, RI	143rd AW	ANG	Intermediate & Organizational
Reno/Tahoe Airport, NV	152nd AW	ANG	Intermediate & Organizational
Rosecrans Memorial Airport, MO	139th AW	ANG	Intermediate & Organizational
Savannah Airport, GA	165th AW	ANG	Intermediate & Organizational
Schenectady County Airport, NY	109th AW	ANG	Intermediate & Organizational
Selfridge ANGB, MI	127th ARW	ANG	Intermediate & Organizational
Will Rogers World Airport, OK	137th AW	ANG	Intermediate & Organizational
Patrick AFB, FL	920th RQG	AFRC	Limited
Gabreski Airport, NY	106th RQW	ANG	Limited
Moffett Field, CA	129th RQW	ANG	Limited
Harrisburg IAP, PA	193rd SOW	ANG	Limited
Hurlburt Field, FL	16th SOW	AFSOC	Limited
RAF Mildenhall , UK	352nd SOG	AFSOC	Limited
Kadena AB, Okinawa	353rd SOG	AFSOC	Limited
Eglin AFB, FL	9th SOS	AFSOC	Limited
Moody AFB, GA	347th RQW	AFSOC	Limited
Davis-Monthan AFB, AZ	55th Wing / 563rd RG	ACC / AFSOC	Limited
OCONUS En Routes	715th / 721st AMOG	AMC	Limited

Data derived from multiple sources

Table C5. KC-10 Logistic Support Locations (2000 – 2004)			
Location	Unit	MAJCOM	Level of Support for AMC
Boeing Aerospace Support Center (BASC), San Antonio, TX	Contractor	AFMC	Depot
McGuire AFB, NJ	305th AMW	AMC	Intermediate & Organizational
Travis AFB, CA	60th AMW	AMC	Intermediate & Organizational
OCONUS En Routes	715th / 721st AMOG	AMC	Limited
Data derived from multiple sources			

Table C6. KC-135 Logistic Support Locations (2000 – 2004)			
Location	Unit	MAJCOM	Level of Support for AMC
Boeing Aerospace Support Center (BASC), San Antonio, TX	Contractor	AFMC	Depot
PEMCO Aeroplex, Birmingham, AL	Contractor	AFMC	Depot
Tinker AFB, OK	OK-OLC	AFMC	Depot
Fairchild AFB,WA	92nd ARW / 141st ARW	AMC / ANG	Intermediate & Organizational
Grand Forks AFB, ND	319th ARW	AMC	Intermediate & Organizational
MacDill AFB, FL	6th ARW	AMC	Intermediate & Organizational
McConnell AFB, KS	22nd ARW / 931st ARG	AMC / AFRC	Intermediate & Organizational
Robins AFB, GA	19th ARG	AMC	Intermediate & Organizational
Mountain Home AFB, ID	366th Wing	ACC	Intermediate & Organizational
Altus AFB, OK	97th AMW	AETC	Intermediate & Organizational
Kadena AB, Okinawa	18th Wing	PACAF	Intermediate & Organizational
RAF Mildenhall , UK	100th ARW	USAFE	Intermediate & Organizational
Beale AFB, CA	940th ARW	AFRC	Intermediate & Organizational
Grissom ARB, IN	434th ARW	AFRC	Intermediate & Organizational
Portland ARB, OR	939th ARW	AFRC	Intermediate & Organizational
Selfridge ANGB, MI	927th ARW	AFRC	Intermediate & Organizational
Seymour-Johnson ARB, NC	916th ARW	AFRC	Intermediate & Organizational
Andrews AFB, MD	459th ARW	AFRC	Intermediate & Organizational
Tinker AFB, OK	507th ARW	AFRC	Intermediate & Organizational
March ARB, CA	452nd AMW / 163rd ARW	AFRC / ANG	Intermediate & Organizational
Bangor IAP, ME	101st ARW	ANG	Intermediate & Organizational
Birmingham Airport, AL	117th ARW	ANG	Intermediate & Organizational
Eielson AFB, AK	168th ARW	ANG	Intermediate & Organizational
Forbes Field, KS	190th ARW	ANG	Intermediate & Organizational
General Mitchell ARB, WI	128th ARW	ANG	Intermediate & Organizational
Hickam AFB, HI	154th Wing	ANG	Intermediate & Organizational
Key Field, MS	186th ARW	ANG	Intermediate & Organizational
Lincoln MAP, NE	155th ARW	ANG	Intermediate & Organizational
McGhee-Tyson ANGB, TN	134th ARW	ANG	Intermediate & Organizational
McGuire AFB, NJ	108th ARW	ANG	Intermediate & Organizational
Niagara Falls ARS, NY	107th ARW	ANG	Intermediate & Organizational
Pease ANGS, NH	157th ARW	ANG	Intermediate & Organizational
Pittsburgh ARB, PA	171st ARW	ANG	Intermediate & Organizational
Rickenbacker ANGB, OH	121st ARW	ANG	Intermediate & Organizational
Scott AFB, IL	126th ARW	ANG	Intermediate & Organizational
Salt Lake City ANGB, UT	151st ARW	ANG	Intermediate & Organizational
Sky Harbor IAP, AZ	161st ARW	ANG	Intermediate & Organizational
Sioux Gateway Airport, IA	185th ARW	ANG	Intermediate & Organizational
McConnell AFB, KS	184th ARW	ANG	Intermediate & Organizational
Offutt AFB, NE	55th Wing	ACC	Limited
OCONUS En Routes	715th / 721st AMOG	AMC	Limited
Data derived from multiple sources			

Appendix D. AMC Logistic Support Data Analysis Summary (2000 -2004)

Table D1. AMC Logistic Support Data Analysis Summary (2000 – 2004)
(Sorted by Location and Fleet)

Data derived from multiple sources

Location (ICAO)	Fleet (MDS)	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
BGTL	C-130	2	189.7	94.9	94.9	81.3	108.4	27.1	13.6	183.6	0.05	18.8	76.1	113.6
BGTL	C-141	15	980.6	65.4	54.0	0.5	170.5	170.0	42.4	1801.5	0.05	21.5	43.9	86.9
BIKF	C-130	20	1410.4	70.5	59.4	7.0	168.5	161.5	47.5	2260.0	0.05	20.8	49.7	91.4
BIKF	C-141	18	694.5	38.6	31.9	11.5	102.5	91.0	23.4	546.7	0.05	10.8	27.8	49.4
BIKF	C-17	5	151.6	30.3	26.7	17.4	53.5	36.1	12.2	148.5	0.05	10.7	19.6	41.0
BIKF	C-5	8	628.0	78.5	62.5	31.5	157.5	126.0	45.9	2103.1	0.05	31.8	46.7	110.3
BIKF	KC-10	3	74.1	24.7	18.0	2.3	53.8	51.5	21.6	464.5	0.05	24.4	0.3	49.1
BIKF	KC-135	11	600.4	54.6	46.8	14.0	121.5	107.5	29.7	882.7	0.05	17.6	37.0	72.1
CYEG	C-130	1	44.5	44.5	44.5	44.5	44.5	0.0	[redacted]					
CYEG	C-141	1	29.3	29.3	29.3	29.3	29.3	0.0	[redacted]					
CYEG	C-5	4	120.2	30.1	34.8	4.3	46.4	42.1	16.5	273.7	0.05	16.2	13.8	46.3
CYHZ	C-130	2	45.0	22.5	22.5	12.5	32.5	20.0	10.0	100.0	0.05	13.9	8.6	36.4
CYHZ	C-141	1	92.0	92.0	92.0	92.0	92.0	0.0	[redacted]					
CYHZ	C-17	1	66.6	66.6	66.6	66.6	66.6	0.0	[redacted]					
CYHZ	C-5	1	120.0	120.0	120.0	120.0	120.0	0.0	[redacted]					
CYHZ	KC-10	1	156.0	156.0	156.0	156.0	156.0	0.0	[redacted]					
CYJT	C-141	1	47.6	47.6	47.6	47.6	47.6	0.0	[redacted]					
CYMM	C-130	1	7.5	7.5	7.5	7.5	7.5	0.0	[redacted]					
CYOD	C-130	4	119.6	29.9	35.7	3.0	45.2	42.2	17.1	293.2	0.05	16.8	13.1	46.7
CYOD	C-5	3	52.3	17.4	20.5	1.0	30.8	29.8	12.4	152.7	0.05	14.0	3.4	31.4
CYOW	C-141	1	29.1	29.1	29.1	29.1	29.1	0.0	[redacted]					
CYOW	C-17	1	17.5	17.5	17.5	17.5	17.5	0.0	[redacted]					
CYQB	C-141	1	32.3	32.3	32.3	32.3	32.3	0.0	[redacted]					
CYQB	C-5	1	12.3	12.3	12.3	12.3	12.3	0.0	[redacted]					
CYQX	C-130	15	740.9	49.4	36.8	0.5	166.0	165.5	43.8	1915.3	0.05	22.1	27.2	71.5
CYQX	C-141	17	1402.6	82.5	64.8	18.8	308.1	289.3	76.5	5849.0	0.05	36.4	46.2	118.9

Location (ICAO)	Fleet (MDS)	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
CYQX	C-17	30	1447.1	48.2	32.7	3.0	223.3	220.3	44.0	1932.5	0.05	15.7	32.5	64.0
CYQX	C-5	33	1959.8	59.4	41.5	0.8	240.1	239.3	45.0	2029.4	0.05	15.4	44.0	74.8
CYQX	KC-135	1	45.8	45.8	45.8	45.8	45.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
CYXX	C-5	1	138.3	138.3	138.3	138.3	138.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
CYYC	KC-10	1	98.5	98.5	98.5	98.5	98.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
CYYR	C-130	13	1175.0	90.4	77.7	36.4	204.0	167.6	46.6	2171.2	0.05	25.3	65.1	115.7
CYYR	C-141	3	118.1	39.4	45.3	16.3	56.5	40.2	16.9	286.9	0.05	19.2	20.2	58.5
CYYR	C-17	1	33.5	33.5	33.5	33.5	33.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
CYYR	C-5	1	78.0	78.0	78.0	78.0	78.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
CYYR	KC-10	5	201.9	40.4	49.0	1.0	66.8	65.8	22.3	498.5	0.05	19.6	20.8	60.0
CYYR	KC-135	9	368.8	41.0	46.0	16.8	55.8	39.0	12.5	156.8	0.05	8.2	32.8	49.2
CYYT	C-130	68	3973.4	58.4	49.1	1.0	219.0	218.0	46.5	1931.7	0.05	11.0	47.4	69.5
CYYT	KC-135	1	5.5	5.5	5.5	5.5	5.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
DGAA	C-5	4	346.4	86.6	77.8	32.3	158.5	126.2	50.5	2548.7	0.05	49.5	37.1	136.1
DNAA	C-141	1	91.5	91.5	91.5	91.5	91.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
DNAA	C-5	1	17.0	17.0	17.0	17.0	17.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
DNMM	C-141	1	4.8	4.8	4.8	4.8	4.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
EBBR	C-5	1	98.7	98.7	98.7	98.7	98.7	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
EDDB	C-17	2	57.0	28.5	28.5	25.2	31.8	6.6	3.3	10.9	0.05	4.6	23.9	33.1
EDDF	C-130	11	935.5	85.1	35.0	9.7	287.5	277.8	83.6	6994.3	0.05	49.4	35.6	134.5
EDDF	C-141	59	2279.7	38.6	19.5	0.8	269.2	268.4	45.0	2026.1	0.05	11.5	27.2	50.1
EDDF	C-17	751	23638.7	31.5	18.5	0.1	332.3	332.2	39.4	1553.1	0.05	2.8	28.7	34.3
EDDF	C-5	398	13387.0	33.6	19.9	0.2	271.5	271.3	41.4	1712.1	0.05	4.1	29.6	37.7
EDDF	KC-10	18	701.1	39.0	29.3	11.2	102.0	90.8	27.5	755.1	0.05	12.7	26.3	51.6
EDDF	KC-135	21	1181.3	56.3	33.0	2.3	193.7	191.4	56.2	3155.2	0.05	24.0	32.2	80.3
EDDH	C-141	1	26.3	26.3	26.3	26.3	26.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
EDDM	C-141	2	51.5	25.8	25.8	21.7	29.8	8.1	4.1	16.4	0.05	5.6	20.1	31.4
EDDN	C-130	1	55.8	55.8	55.8	55.8	55.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
EDDS	C-5	9	169.6	18.8	17.0	6.5	38.0	31.5	53.1	2822.2	0.05	34.7	-15.9	53.5
EDDS	KC-135	1	28.8	28.8	28.8	28.8	28.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
EDDT	C-5	1	17.3	17.3	17.3	17.3	17.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
EFTP	C-130	1	201.3	201.3	201.3	201.3	201.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Location (ICAO)	Fleet (MDS)	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
EGDL	C-17	1	14.5	14.5	14.5	14.5	14.5	0.0						
EGLF	C-17	1	23.2	23.2	23.2	23.2	23.2	0.0						
EGLL	C-17	1	12.9	12.9	12.9	12.9	12.9	0.0						
EGPH	C-130	1	95.0	95.0	95.0	95.0	95.0	0.0						
EGPK	C-130	11	785.0	71.4	43.5	34.5	152.7	118.2	38.8	1507.0	0.05	22.9	48.4	94.3
EGPK	C-141	1	17.5	17.5	17.5	17.5	17.5	0.0						
EGPK	C-5	6	227.8	38.0	38.4	8.5	64.8	56.3	19.9	397.6	0.05	16.0	22.0	53.9
EGPK	KC-10	1	106.0	106.0	106.0	106.0	106.0	0.0						
EGPK	KC-135	2	78.8	39.4	39.4	33.8	45.0	11.2	5.6	31.4	0.05	7.8	31.6	47.2
EGQK	KC-135	1	12.5	12.5	12.5	12.5	12.5	0.0						
EGSC	C-130	1	235.5	235.5	235.5	235.5	235.5	0.0						
EGSS	C-17	1	22.8	22.8	22.8	22.8	22.8	0.0						
EGUL	C-130	3	158.0	52.7	40.5	2.0	115.5	113.5	47.1	2221.1	0.05	53.3	-0.7	106.0
EGUL	C-141	2	36.8	18.4	18.4	3.3	33.5	30.2	15.1	228.0	0.05	20.9	-2.5	39.3
EGUL	C-17	5	173.3	34.7	3.4	1.5	126.5	125.0	48.2	2321.1	0.05	42.2	-7.6	76.9
EGUL	C-5	19	277.6	14.6	5.5	1.7	54.5	52.8	16.5	272.9	0.05	7.4	7.2	22.0
EGUL	KC-10	2	104.5	52.3	52.3	47.5	57.0	9.5	4.8	22.6	0.05	6.6	45.7	58.8
EGUL	KC-135	5	221.7	44.3	13.5	0.8	177.0	176.2	66.8	4463.4	0.05	58.6	-14.2	102.9
EGUN	C-130	34	1439.3	42.3	38.7	0.5	127.3	126.8	32.1	1028.5	0.05	10.8	31.6	53.1
EGUN	C-141	28	1098.6	39.2	20.2	0.8	170.5	169.7	43.9	1925.2	0.05	16.3	23.0	55.5
EGUN	C-17	22	1016.5	46.2	30.0	0.3	198.5	198.2	52.1	2710.7	0.05	21.8	24.4	68.0
EGUN	C-5	152	5986.6	39.4	22.9	0.7	219.0	218.3	41.9	1753.7	0.05	6.7	32.7	46.0
EGUN	KC-10	33	1264.4	38.3	26.0	1.5	103.0	101.5	27.9	779.9	0.05	9.5	28.8	47.8
EGUN	KC-135	63	3936.3	62.5	32.5	0.7	353.3	352.6	73.9	5454.1	0.05	18.2	44.2	80.7
EGVA	C-17	2	56.5	28.3	28.3	16.5	40.0	23.5	11.8	138.1	0.05	16.3	12.0	44.5
EGVA	C-5	1	21.0	21.0	21.0	21.0	21.0	0.0						
EGVA	KC-135	1	4.0	4.0	4.0	4.0	4.0	0.0						
EGVN	C-130	1	48.5	48.5	48.5	48.5	48.5	0.0						
EGVN	C-5	3	101.7	33.9	27.2	17.0	57.5	40.5	17.2	295.8	0.05	19.5	14.4	53.4
EGVN	KC-10	1	71.7	71.7	71.7	71.7	71.7	0.0						
EGVN	KC-135	2	97.7	48.9	48.9	14.7	83.0	68.3	34.2	1166.2	0.05	47.3	1.5	96.2
EGXJ	C-17	1	33.0	33.0	33.0	33.0	33.0	0.0						

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EGXJ	C-5	1	253.0	253.0	253.0	253.0	253.0	0.0	[redacted]					
EINN	C-130	7	221.5	31.6	34.8	2.8	48.5	45.7	15.3	233.1	0.05	11.3	20.3	43.0
EINN	C-5	1	67.5	67.5	67.5	67.5	67.5	0.0	[redacted]					
EKKA	C-5	2	51.5	25.8	25.8	23.5	28.0	4.5	2.3	5.1	0.05	3.1	22.6	28.9
EKVL	C-17	1	49.5	49.5	49.5	49.5	49.5	0.0	[redacted]					
ELLX	C-5	1	10.2	10.2	10.2	10.2	10.2	0.0	[redacted]					
ENBO	KC-10	1	141.0	141.0	141.0	141.0	141.0	0.0	[redacted]					
EPWA	C-17	1	24.5	24.5	24.5	24.5	24.5	0.0	[redacted]					
ETAD	C-130	2	16.5	8.3	8.3	4.5	12.0	7.5	7.8	28.1	0.05	10.8	-2.6	19.1
ETAD	C-141	6	94.3	15.7	11.6	7.5	34.5	27.0	3.0	111.5	0.05	2.4	13.3	18.1
ETAD	C-17	1	5.0	5.0	5.0	5.0	5.0	0.0	[redacted]					
ETAD	C-5	11	165.7	15.1	12.5	6.0	24.0	18.0	6.1	37.3	0.05	3.6	11.5	18.7
ETAD	KC-135	1	25.5	25.5	25.5	25.5	25.5	0.0	[redacted]					
ETAR	C-130	34	1775.9	52.2	34.8	0.5	165.0	164.5	47.0	2210.2	0.05	15.8	36.4	68.0
ETAR	C-141	357	11351.6	31.8	20.3	0.2	449.5	449.3	42.2	1780.2	0.05	4.4	27.4	36.2
ETAR	C-17	427	12906.5	30.2	18.0	0.1	292.5	292.4	38.5	1481.6	0.05	3.7	26.6	33.9
ETAR	C-5	543	17135.9	31.6	16.5	0.1	357.0	356.9	44.4	1967.5	0.05	3.7	27.8	35.3
ETAR	KC-10	10	302.1	30.2	28.5	1.0	77.0	76.0	25.9	671.9	0.05	16.1	14.1	46.3
ETAR	KC-135	11	563.0	51.2	46.5	2.8	122.3	119.5	38.6	1490.2	0.05	22.8	28.4	74.0
ETNG	KC-135	5	244.1	48.8	43.5	6.8	104.3	97.5	35.1	1235.3	0.05	30.8	18.0	79.6
ETOU	C-130	1	28.5	28.5	28.5	28.5	28.5	0.0	[redacted]					
FACT	C-141	3	373.5	124.5	119.5	88.5	165.5	77.0	38.7	1501.0	0.05	43.8	80.7	168.3
FACT	C-17	1	2.0	2.0	2.0	2.0	2.0	0.0	[redacted]					
FAHS	C-5	1	66.4	66.4	66.4	66.4	66.4	0.0	[redacted]					
FAJS	C-5	3	95.2	31.7	22.5	17.3	55.4	38.1	20.7	426.8	0.05	23.4	8.4	55.1
FAWK	C-141	5	485.7	97.1	90.5	74.7	137.0	62.3	24.1	582.7	0.05	21.2	76.0	118.3
FAWK	C-17	2	97.6	48.8	48.8	14.8	82.8	68.0	48.1	2312.0	0.05	66.6	-17.8	115.4
FAWK	C-5	3	472.1	157.4	146.1	65.0	261.0	196.0	98.5	9699.2	0.05	111.4	45.9	268.8
FAWK	KC-135	1	42.9	42.9	42.9	42.9	42.9	0.0	[redacted]					
FBSK	C-141	1	49.2	49.2	49.2	49.2	49.2	0.0	[redacted]					
FDMS	C-141	1	95.0	95.0	95.0	95.0	95.0	0.0	[redacted]					
FHAW	C-130	1	13.4	13.4	13.4	13.4	13.4	0.0	[redacted]					

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FHAW	C-141	4	108.1	27.0	3.6	0.9	100.0	99.1	48.7	2372.9	0.05	47.7	-20.7	74.8
FHAW	C-17	4	286.8	71.7	73.5	47.3	92.5	45.2	20.0	398.8	0.05	19.6	52.1	91.3
FHAW	C-5	9	726.8	80.8	59.5	8.0	308.3	300.3	91.7	8411.7	0.05	59.9	20.8	140.7
FHAW	KC-10	2	139.8	69.9	69.9	56.5	83.3	26.8	19.0	359.1	0.05	26.3	43.6	96.2
FHAW	KC-135	1	142.4	142.4	142.4	142.4	142.4	0.0						
FIMP	C-17	1	116.5	116.5	116.5	116.5	116.5	0.0						
FIMP	C-5	1	179.5	179.5	179.5	179.5	179.5	0.0						
FJDG	C-141	6	261.5	43.6	42.3	19.8	73.2	53.4	18.9	358.0	0.05	15.1	28.4	58.7
FJDG	C-17	35	2323.9	66.4	51.5	1.3	232.7	231.4	51.8	2682.8	0.05	17.2	49.2	83.6
FJDG	C-5	48	2933.1	61.1	42.8	1.5	239.0	237.5	56.7	3214.3	0.05	16.0	45.1	77.1
FJDG	KC-10	64	5669.8	88.6	70.5	1.0	395.3	394.3	82.7	6842.1	0.05	20.3	68.3	108.9
FJDG	KC-135	85	7303.3	85.9	70.5	0.3	320.5	320.2	74.5	5543.1	0.05	15.8	70.1	101.7
FKYS	C-141	1	133.3	133.3	133.3	133.3	133.3	0.0						
FQMA	C-130	1	76.8	76.8	76.8	76.8	76.8	0.0						
FTTJ	C-141	1	90.3	90.3	90.3	90.3	90.3	0.0						
GMMX	C-17	1	90.5	90.5	90.5	90.5	90.5	0.0						
GOOY	C-141	1	21.5	21.5	21.5	21.5	21.5	0.0						
GOOY	C-17	1	26.9	26.9	26.9	26.9	26.9	0.0						
GOOY	C-5	4	165.4	41.4	39.0	34.5	53.0	18.5	8.1	65.5	0.05	7.9	33.4	49.3
GUCY	C-17	1	56.3	56.3	56.3	56.3	56.3	0.0						
GVAC	C-141	1	0.2	0.2	0.2	0.2	0.2	0.0						
GVAC	C-17	2	164.0	82.0	82.0	51.0	113.0	62.0	43.8	1922.0	0.05	60.8	21.2	142.8
HDAM	C-141	1	133.5	133.5	133.5	133.5	133.5	0.0						
HDAM	C-17	1	77.5	77.5	77.5	77.5	77.5	0.0						
HDAM	C-5	1	69.5	69.5	69.5	69.5	69.5	0.0						
HECA	C-17	2	183.3	91.7	91.7	49.8	133.5	83.7	59.2	3502.8	0.05	82.0	9.6	173.7
HECA	C-5	3	221.3	73.8	75.3	50.0	96.0	46.0	23.0	530.8	0.05	26.1	47.7	99.8
HECA	KC-135	5	286.2	57.2	42.5	27.2	111.5	84.3	36.1	1303.3	0.05	31.6	25.6	88.9
HECW	C-141	1	37.3	37.3	37.3	37.3	37.3	0.0						
HECW	C-5	3	449.2	149.7	60.0	1.0	388.2	387.2	208.6	43520.0	0.05	236.1	-86.3	385.8
HESH	C-17	1	9.3	9.3	9.3	9.3	9.3	0.0						
HESH	C-5	1	74.3	74.3	74.3	74.3	74.3	0.0						

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HHAS	C-17	1	1.3	1.3	1.3	1.3	1.3	0.0						
HKJK	C-141	2	183.5	91.8	91.8	29.0	154.5	125.5	88.7	7875.1	0.05	123.0	-31.2	214.7
HKJK	C-17	1	1.3	1.3	1.3	1.3	1.3	0.0						
HUEN	C-17	1	161.5	161.5	161.5	161.5	161.5	0.0						
HUEN	C-5	1	64.3	64.3	64.3	64.3	64.3	0.0						
KABQ	C-130	8	180.6	22.6	26.0	4.8	41.3	36.5	13.3	176.3	0.05	9.2	13.4	31.8
KABQ	C-141	13	583.7	44.9	37.7	2.3	120.1	117.8	36.0	1296.6	0.05	19.6	25.3	64.5
KABQ	C-17	3	105.0	35.0	35.3	25.0	44.7	19.7	9.9	97.1	0.05	11.1	23.9	46.1
KABQ	C-5	4	157.7	39.4	28.4	12.5	88.5	76.0	34.9	1219.8	0.05	34.2	5.2	73.7
KABQ	KC-10	2	272.5	136.3	136.3	30.0	242.5	212.5	150.3	22578.1	0.05	208.2	-72.0	344.5
KABY	C-130	1	5.8	5.8	5.8	5.8	5.8	0.0						
KADW	C-130	77	2067.1	26.9	23.5	0.2	136.8	136.6	25.4	645.7	0.05	5.7	21.2	32.5
KADW	C-141	184	3131.1	17.0	14.3	0.1	81.7	81.6	16.1	258.5	0.05	2.3	14.7	19.3
KADW	C-17	82	1632.7	19.9	16.8	0.3	94.1	93.8	16.0	256.5	0.05	3.5	16.4	23.4
KADW	C-5	108	1856.3	17.2	10.0	0.3	234.0	233.7	28.9	833.1	0.05	5.4	11.7	22.6
KADW	KC-10	10	115.0	11.5	10.7	2.0	31.9	29.9	8.9	79.1	0.05	5.5	6.0	17.0
KADW	KC-135	29	914.1	31.5	23.5	2.5	138.9	136.4	31.4	986.8	0.05	11.4	20.1	43.0
KAEX	C-130	6	141.3	23.6	22.9	13.6	33.8	20.2	8.8	77.3	0.05	7.0	16.5	30.6
KAEX	C-141	2	60.9	30.5	30.5	20.4	40.5	20.1	14.2	202.0	0.05	19.7	10.8	50.1
KAEX	C-17	1	31.0	31.0	31.0	31.0	31.0	0.0						
KAEX	C-5	18	543.7	30.2	23.9	3.0	78.1	75.1	19.3	372.7	0.05	8.9	21.3	39.1
KAEX	KC-10	1	19.1	19.1	19.1	19.1	19.1	0.0						
KAFW	C-5	1	211.0	211.0	211.0	211.0	211.0	0.0						
KAGS	C-130	3	84.9	28.3	24.0	16.9	44.0	27.1	14.1	197.5	0.05	15.9	12.4	44.2
KAGS	C-17	1	7.4	7.4	7.4	7.4	7.4	0.0						
KAGS	C-5	3	95.7	31.9	24.6	18.0	53.1	35.1	18.7	348.0	0.05	21.1	10.8	53.0
KAHC	C-17	1	16.0	16.0	16.0	16.0	16.0	0.0						
KAHC	C-5	2	31.0	15.5	15.5	15.0	16.0	1.0	0.7	0.5	0.05	1.0	14.5	16.5
KALB	C-141	1	10.8	10.8	10.8	10.8	10.8	0.0						
KAMA	C-17	2	19.5	9.8	9.8	9.3	10.2	0.9	0.6	0.4	0.05	0.9	8.9	10.6
KAPG	C-17	2	30.0	15.0	15.0	4.5	25.5	21.0	14.8	220.5	0.05	20.6	-5.6	35.6
KAPN	C-5	1	2.5	2.5	2.5	2.5	2.5	0.0						

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KATL	C-130	3	50.2	16.7	21.7	4.0	24.5	20.5	11.1	123.6	0.05	12.6	4.2	29.3
KATL	C-141	1	19.0	19.0	19.0	19.0	19.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KAUS	C-141	2	35.5	17.8	17.8	9.5	26.0	16.5	11.7	136.1	0.05	16.2	1.6	33.9
KAUS	KC-135	1	18.5	18.5	18.5	18.5	18.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KAYX	C-5	2	80.1	40.1	40.1	25.7	54.4	28.7	20.3	411.8	0.05	28.1	11.9	68.2
KBAB	C-17	1	29.8	29.8	29.8	29.8	29.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KBAB	C-5	1	13.5	13.5	13.5	13.5	13.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KBAB	KC-135	8	264.5	33.1	33.0	2.0	57.0	55.0	20.4	417.4	0.05	14.2	18.9	47.2
KBAD	C-130	5	110.7	22.1	17.9	6.0	54.8	48.8	19.0	359.6	0.05	16.6	5.5	38.8
KBAD	C-141	4	101.3	25.3	21.5	19.3	39.0	19.7	9.3	85.7	0.05	9.1	16.3	34.4
KBAD	C-17	1	46.5	46.5	46.5	46.5	46.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KBAD	C-5	1	20.5	20.5	20.5	20.5	20.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KBAD	KC-10	2	87.3	43.7	43.7	22.0	65.3	43.3	30.6	937.4	0.05	42.4	1.2	86.1
KBAF	C-17	2	33.5	16.8	16.8	13.0	20.5	7.5	5.3	28.1	0.05	7.3	9.4	24.1
KBAK	C-130	1	30.3	30.3	30.3	30.3	30.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KBDL	C-5	1	1.5	1.5	1.5	1.5	1.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KBED	C-130	2	45.8	22.9	22.9	22.8	23.0	0.2	0.1	0.0	0.05	0.2	22.7	23.1
KBFI	C-17	2	3.6	1.8	1.8	0.1	3.5	3.4	2.4	5.8	0.05	3.3	-1.5	5.1
KBFI	C-5	1	14.3	14.3	14.3	14.3	14.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KBGR	C-130	4	357.5	89.4	70.8	42.5	173.5	131.0	58.1	3379.7	0.05	57.0	32.4	146.4
KBGR	C-141	7	353.9	50.6	23.0	2.1	141.0	138.9	54.9	3010.1	0.05	40.6	9.9	91.2
KBGR	C-17	25	995.8	39.8	25.5	0.8	241.3	240.5	54.8	3005.5	0.05	21.5	18.3	61.3
KBGR	C-5	11	578.1	52.6	29.7	11.9	237.0	225.1	63.5	4029.8	0.05	37.5	15.0	90.1
KBGR	KC-10	8	149.5	18.7	18.3	10.0	29.0	19.0	6.4	40.8	0.05	4.4	14.3	23.1
KBGR	KC-135	42	2632.2	62.7	47.5	1.5	401.5	400.0	67.5	4549.5	0.05	20.4	42.3	83.1
KBHM	C-130	2	31.4	15.7	15.7	9.0	22.4	13.4	9.5	89.8	0.05	13.1	2.6	28.8
KBIF	C-130	3	94.3	31.4	26.0	17.3	51.0	33.7	17.5	306.1	0.05	19.8	11.6	51.2
KBIF	C-141	1	55.5	55.5	55.5	55.5	55.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KBIF	C-17	6	138.8	23.1	22.8	2.0	45.9	43.9	15.7	246.0	0.05	12.5	10.6	35.7
KBIF	C-5	18	736.6	40.9	35.8	4.9	112.0	107.1	25.0	624.5	0.05	11.5	29.4	52.5
KBIF	KC-10	4	46.8	11.7	5.9	1.5	33.5	32.0	14.9	223.2	0.05	14.6	-2.9	26.3
KBIF	KC-135	1	67.4	67.4	67.4	67.4	67.4	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Location (ICAO)	Fleet (MDS)	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
KBIL	C-130	1	26.5	26.5	26.5	26.5	26.5	0.0						
KBIX	C-130	3	75.1	25.0	2.0	0.1	73.0	72.9	41.6	1726.5	0.05	47.0	-22.0	72.0
KBKF	C-130	6	219.7	36.6	29.8	8.5	77.0	68.5	24.0	576.7	0.05	19.2	17.4	55.8
KBKF	C-17	1	24.0	24.0	24.0	24.0	24.0	0.0						
KBKF	C-5	13	326.3	25.1	24.3	2.0	48.7	46.7	14.9	222.3	0.05	8.1	17.0	33.2
KBKT	C-130	1	30.5	30.5	30.5	30.5	30.5	0.0						
KBKT	C-17	1	8.2	8.2	8.2	8.2	8.2	0.0						
KBLV	C-130	34	873.7	25.7	22.3	0.5	97.5	97.0	19.2	369.8	0.05	6.5	19.2	32.2
KBLV	C-141	6	180.3	30.1	18.3	2.8	74.5	71.7	26.8	716.9	0.05	21.4	8.6	51.5
KBLV	C-17	2	35.7	17.9	17.9	10.3	25.4	15.1	10.7	114.0	0.05	14.8	3.1	32.6
KBLV	C-5	3	156.1	52.0	43.1	39.5	73.5	34.0	18.7	348.9	0.05	21.1	30.9	73.2
KBLV	KC-10	2	16.1	8.1	8.1	2.5	13.6	11.1	7.8	61.6	0.05	10.9	-2.8	18.9
KBLV	KC-135	4	174.3	43.6	34.4	14.3	91.2	76.9	35.3	1245.8	0.05	34.6	9.0	78.2
KBNA	C-130	4	183.3	45.8	44.8	17.0	76.7	59.7	25.1	628.1	0.05	24.6	21.3	70.4
KBNA	C-141	4	81.2	20.3	18.5	15.8	28.4	12.6	5.9	34.9	0.05	5.8	14.5	26.1
KBNA	C-17	1	3.0	3.0	3.0	3.0	3.0	0.0						
KBNA	C-5	1	53.0	53.0	53.0	53.0	53.0	0.0						
KBOI	C-130	3	28.0	9.3	3.0	1.5	23.5	22.0	12.3	151.1	0.05	13.9	-4.6	23.2
KBOI	C-141	1	30.2	30.2	30.2	30.2	30.2	0.0						
KBOI	C-17	1	18.1	18.1	18.1	18.1	18.1	0.0						
KBOI	C-5	3	130.4	43.5	23.5	21.9	85.0	63.1	36.0	1294.4	0.05	40.7	2.8	84.2
KBOI	KC-10	1	13.4	13.4	13.4	13.4	13.4	0.0						
KBOS	C-141	1	5.3	5.3	5.3	5.3	5.3	0.0						
KBTL	C-130	1	25.2	25.2	25.2	25.2	25.2	0.0						
KBTV	C-141	1	7.0	7.0	7.0	7.0	7.0	0.0						
KBTV	C-5	1	86.5	86.5	86.5	86.5	86.5	0.0						
KBUR	C-130	1	10.3	10.3	10.3	10.3	10.3	0.0						
KBUR	C-141	2	105.3	52.7	52.7	49.0	56.3	7.3	5.2	26.6	0.05	7.2	45.5	59.8
KBWI	C-130	1	9.5	9.5	9.5	9.5	9.5	0.0						
KCBM	C-141	1	24.0	24.0	24.0	24.0	24.0	0.0						
KCBM	C-5	1	101.3	101.3	101.3	101.3	101.3	0.0						
KCBM	KC-10	1	26.0	26.0	26.0	26.0	26.0	0.0						

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KCEF	C-130	9	229.3	25.5	28.4	1.3	47.9	46.6	17.4	304.4	0.05	11.4	14.1	36.9
KCEF	C-141	2	47.6	23.8	23.8	23.3	24.3	1.0	0.7	0.5	0.05	1.0	22.8	24.8
KCEF	C-17	1	24.5	24.5	24.5	24.5	24.5	0.0						
KCEF	C-5	46	2428.5	52.8	28.6	0.5	314.0	313.5	64.5	4165.7	0.05	18.7	34.1	71.4
KCEF	KC-10	2	20.7	10.4	10.4	6.5	14.2	7.7	5.4	29.6	0.05	7.5	2.8	17.9
KCHS	C-130	51	1243.4	24.4	18.1	0.3	184.5	184.2	26.7	711.2	0.05	7.3	17.1	31.7
KCHS	C-141	39	894.0	22.9	18.5	0.3	98.5	98.2	20.2	406.2	0.05	6.3	16.6	29.2
KCHS	C-17	74	1635.6	22.1	6.9	0.1	377.0	376.9	47.9	2294.6	0.05	10.9	11.2	33.0
KCHS	C-5	110	3824.6	34.8	21.5	0.4	267.0	266.6	38.0	1441.7	0.05	7.1	27.7	41.9
KCHS	KC-10	13	476.3	36.6	28.0	1.5	168.6	167.1	40.9	1675.4	0.05	22.3	14.4	58.9
KCHS	KC-135	24	668.3	27.9	26.5	1.0	50.2	49.2	13.3	176.5	0.05	5.3	22.5	33.2
KCLE	C-130	1	2.0	2.0	2.0	2.0	2.0	0.0						
KCLT	C-130	1	43.2	43.2	43.2	43.2	43.2	0.0						
KCLT	C-5	2	63.3	31.7	31.7	20.3	43.0	22.7	16.1	257.6	0.05	22.2	9.4	53.9
KCNW	C-17	2	21.0	10.5	10.5	0.5	20.5	20.0	14.1	200.0	0.05	19.6	-9.1	30.1
KCNW	C-5	2	45.7	22.9	22.9	20.5	25.2	4.7	3.3	11.0	0.05	4.6	18.2	27.5
KCOF	C-130	9	460.0	51.1	37.8	4.7	140.5	135.8	49.4	2436.7	0.05	32.2	18.9	83.4
KCOF	C-17	4	76.8	19.2	24.3	1.0	27.3	26.3	12.2	149.7	0.05	12.0	7.2	31.2
KCOF	C-5	6	228.2	38.0	39.1	17.0	60.8	43.8	17.4	303.4	0.05	13.9	24.1	52.0
KCOF	KC-135	1	12.5	12.5	12.5	12.5	12.5	0.0						
KCOS	C-130	28	1030.1	36.8	26.1	0.3	143.7	143.4	34.0	1156.5	0.05	12.6	24.2	49.4
KCOS	C-141	3	70.4	23.5	24.8	11.8	33.8	22.0	11.1	122.3	0.05	12.5	11.0	36.0
KCOS	C-17	9	475.2	52.8	42.5	20.0	138.3	118.3	41.3	1703.9	0.05	27.0	25.8	79.8
KCOS	C-5	25	1291.6	51.7	26.0	0.3	195.5	195.2	51.5	2649.1	0.05	20.2	31.5	71.8
KCOS	KC-10	7	196.4	28.1	21.0	18.5	49.8	31.3	12.6	158.5	0.05	9.3	18.7	37.4
KCOS	KC-135	8	311.1	38.9	26.4	15.5	114.0	98.5	33.0	1088.5	0.05	22.9	16.0	61.8
KCOU	C-130	1	11.3	11.3	11.3	11.3	11.3	0.0						
KCPR	C-141	1	20.0	20.0	20.0	20.0	20.0	0.0						
KCPR	C-17	1	16.5	16.5	16.5	16.5	16.5	0.0						
KCRP	C-5	1	40.8	40.8	40.8	40.8	40.8	0.0						
KCRW	C-130	3	40.2	13.4	14.2	4.3	21.7	17.4	8.7	76.2	0.05	9.9	3.5	23.3
KCRW	C-17	1	4.0	4.0	4.0	4.0	4.0	0.0						

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KCRW	C-5	1	149.0	149.0	149.0	149.0	149.0	0.0						
KCVS	C-130	2	115.4	57.7	57.7	38.3	77.1	38.8	27.4	752.7	0.05	38.0	19.7	95.7
KCVS	C-17	1	76.5	76.5	76.5	76.5	76.5	0.0						
KCVS	C-5	1	19.0	19.0	19.0	19.0	19.0	0.0						
KCVS	KC-10	1	12.8	12.8	12.8	12.8	12.8	0.0						
KCVS	KC-135	1	54.3	54.3	54.3	54.3	54.3	0.0						
KCYS	C-130	1	20.0	20.0	20.0	20.0	20.0	0.0						
KCYS	C-141	1	26.0	26.0	26.0	26.0	26.0	0.0						
KCYS	C-17	1	6.0	6.0	6.0	6.0	6.0	0.0						
KCYS	C-5	1	22.0	22.0	22.0	22.0	22.0	0.0						
KDAB	C-141	1	22.4	22.4	22.4	22.4	22.4	0.0						
KDAL	C-130	1	18.6	18.6	18.6	18.6	18.6	0.0						
KDAL	C-141	1	18.0	18.0	18.0	18.0	18.0	0.0						
KDAL	C-5	1	31.7	31.7	31.7	31.7	31.7	0.0						
KDAY	C-130	1	20.5	20.5	20.5	20.5	20.5	0.0						
KDHN	C-5	1	57.9	57.9	57.9	57.9	57.9	0.0						
KDLH	C-5	1	24.5	24.5	24.5	24.5	24.5	0.0						
KDMA	C-130	10	263.6	26.4	10.7	1.7	117.0	115.3	37.4	1401.6	0.05	23.2	3.2	49.6
KDMA	C-141	4	128.9	32.2	33.6	15.3	46.5	31.2	15.0	224.1	0.05	14.7	17.6	46.9
KDMA	C-17	6	278.2	46.4	54.0	11.5	69.5	58.0	23.5	550.9	0.05	18.8	27.6	65.2
KDMA	C-5	9	352.0	39.1	33.0	1.0	70.3	69.3	21.9	480.4	0.05	14.3	24.8	53.4
KDMA	KC-10	2	23.8	11.9	11.9	5.5	18.3	12.8	9.1	81.9	0.05	12.5	-0.6	24.4
KDMA	KC-135	1	43.8	43.8	43.8	43.8	43.8	0.0						
KDOV	C-130	17	573.8	33.8	22.0	3.5	128.0	124.5	32.0	1020.9	0.05	15.2	18.6	48.9
KDOV	C-141	55	966.5	17.6	12.5	0.4	76.0	75.6	16.5	271.3	0.05	4.4	13.2	21.9
KDOV	C-17	53	1462.1	27.6	20.4	0.5	120.3	119.8	24.5	601.9	0.05	6.6	21.0	34.2
KDOV	C-5	474	16187.5	34.2	17.7	0.1	302.5	302.4	44.4	1972.1	0.05	4.0	30.2	38.1
KDOV	KC-10	9	218.7	24.3	13.0	5.8	72.0	66.2	22.9	525.1	0.05	15.0	9.3	39.3
KDOV	KC-135	3	105.5	35.2	39.3	18.5	47.7	29.2	15.0	226.0	0.05	17.0	18.2	52.2
KDSM	C-130	1	21.0	21.0	21.0	21.0	21.0	0.0						
KDSM	C-141	1	24.9	24.9	24.9	24.9	24.9	0.0						
KDTW	C-130	1	5.5	5.5	5.5	5.5	5.5	0.0						

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KDTW	C-5	1	34.8	34.8	34.8	34.8	34.8	0.0						
KDYS	C-130	5	72.0	14.4	5.0	1.0	49.5	48.5	20.0	399.2	0.05	17.5	-3.1	31.9
KDYS	C-141	1	3.8	3.8	3.8	3.8	3.8	0.0						
KDYS	C-17	2	45.7	22.9	22.9	22.2	23.5	1.3	0.9	0.8	0.05	1.3	21.6	24.1
KDYS	C-5	5	309.4	61.9	33.3	29.5	133.0	103.5	45.3	2056.2	0.05	39.7	22.1	101.6
KDYS	KC-10	4	83.0	20.8	16.5	4.7	45.3	40.6	17.3	298.8	0.05	16.9	3.8	37.7
KDYS	KC-135	10	510.2	51.0	30.9	12.0	141.0	129.0	45.1	2038.4	0.05	28.0	23.0	79.0
KEAU	C-141	1	14.0	14.0	14.0	14.0	14.0	0.0						
KEDW	C-141	1	35.9	35.9	35.9	35.9	35.9	0.0						
KEDW	C-17	3	33.9	11.3	6.0	4.8	23.1	18.3	10.2	104.8	0.05	11.6	-0.3	22.9
KEDW	C-5	1	132.5	132.5	132.5	132.5	132.5	0.0						
KEDW	KC-10	32	842.2	26.3	18.8	9.8	91.5	81.7	19.5	380.8	0.05	6.8	19.6	33.1
KEDW	KC-135	26	983.4	37.8	25.8	2.0	139.5	137.5	35.3	1246.5	0.05	13.6	24.2	51.4
KEFD	C-130	2	64.8	32.4	32.4	21.0	43.8	22.8	16.1	259.9	0.05	22.3	10.1	54.7
KEFD	C-17	1	44.5	44.5	44.5	44.5	44.5	0.0						
KEFD	C-5	3	55.2	18.4	17.8	7.5	29.9	22.4	11.2	125.7	0.05	12.7	5.7	31.1
KEFD	KC-135	1	23.5	23.5	23.5	23.5	23.5	0.0						
KEGE	C-130	1	24.0	24.0	24.0	24.0	24.0	0.0						
KEGI	C-5	1	40.5	40.5	40.5	40.5	40.5	0.0						
KENV	C-130	2	47.0	23.5	23.5	21.0	26.0	5.0	3.5	12.5	0.05	4.9	18.6	28.4
KEWR	C-17	1	63.3	63.3	63.3	63.3	63.3	0.0						
KFAR	C-141	1	17.3	17.3	17.3	17.3	17.3	0.0						
KFAR	C-5	1	27.5	27.5	27.5	27.5	27.5	0.0						
KFAT	C-5	1	7.5	7.5	7.5	7.5	7.5	0.0						
KFAY	C-130	2	479.2	239.6	239.6	69.9	409.3	339.4	240.0	57596.2	0.05	332.6	-93.0	572.2
KFCS	C-130	1	83.5	83.5	83.5	83.5	83.5	0.0						
KFDY	C-17	1	27.5	27.5	27.5	27.5	27.5	0.0						
KFFO	C-130	1	34.8	34.8	34.8	34.8	34.8	0.0						
KFFO	C-141	8	408.7	51.1	15.2	0.2	325.3	325.1	111.1	12350.5	0.05	77.0	-25.9	128.1
KFFO	C-5	14	503.7	36.0	26.4	11.3	103.0	91.7	25.7	658.5	0.05	13.4	22.5	49.4
KFFO	KC-10	2	62.3	31.2	31.2	21.0	41.3	20.3	14.4	206.0	0.05	19.9	11.3	51.0
KFFO	KC-135	1	28.8	28.8	28.8	28.8	28.8	0.0						

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KFHU	C-130	8	310.6	38.8	39.4	4.0	72.8	68.8	22.2	493.8	0.05	15.4	23.4	54.2
KFHU	C-17	4	124.2	31.1	28.5	23.2	44.0	20.8	9.8	95.5	0.05	9.6	21.5	40.6
KFHU	C-5	4	104.7	26.2	20.9	18.5	44.5	26.0	12.3	151.7	0.05	12.1	14.1	38.2
KFNL	C-130	2	40.8	20.4	20.4	14.5	26.3	11.8	8.3	69.6	0.05	11.6	8.8	32.0
KFOE	C-130	1	0.5	0.5	0.5	0.5	0.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KFOE	C-141	1	20.2	20.2	20.2	20.2	20.2	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KFOE	C-17	1	32.5	32.5	32.5	32.5	32.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KFOE	C-5	6	151.7	25.3	25.8	9.8	42.8	33.0	11.5	131.5	0.05	9.2	16.1	34.5
KFOE	KC-10	2	63.5	31.8	31.8	17.0	46.5	29.5	20.9	435.1	0.05	28.9	2.8	60.7
KFOK	C-5	2	25.5	12.8	12.8	5.0	20.5	15.5	11.0	120.1	0.05	15.2	-2.4	27.9
KFSD	C-17	1	8.9	8.9	8.9	8.9	8.9	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KFSD	C-5	1	37.5	37.5	37.5	37.5	37.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KFTK	C-130	1	21.8	21.8	21.8	21.8	21.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KGCN	C-141	1	96.0	96.0	96.0	96.0	96.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KGNF	C-130	1	27.5	27.5	27.5	27.5	27.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KGPT	C-130	3	79.8	26.6	24.5	11.5	43.8	32.3	16.3	264.1	0.05	18.4	8.2	45.0
KGPT	C-141	1	25.0	25.0	25.0	25.0	25.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KGPT	C-17	1	122.8	122.8	122.8	122.8	122.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KGPT	C-5	5	206.0	41.2	52.0	10.8	59.5	48.7	20.0	400.8	0.05	17.5	23.7	58.7
KGPT	KC-10	1	10.1	10.1	10.1	10.1	10.1	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KGPT	KC-135	3	44.9	15.0	8.0	7.5	29.4	21.9	12.5	156.3	0.05	14.1	0.8	29.1
KGRB	C-5	1	8.5	8.5	8.5	8.5	8.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KGRF	C-130	1	30.8	30.8	30.8	30.8	30.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KGRF	C-141	1	4.3	4.3	4.3	4.3	4.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KGRK	C-130	1	40.2	40.2	40.2	40.2	40.2	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KGRK	C-17	1	16.7	16.7	16.7	16.7	16.7	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KGRK	C-5	22	708.2	32.2	26.3	2.0	119.2	117.2	27.9	781.0	0.05	11.7	20.5	43.9
KGRK	KC-10	2	58.1	29.1	29.1	28.1	30.0	1.9	1.3	1.8	0.05	1.9	27.2	30.9
KGRR	C-130	1	2.0	2.0	2.0	2.0	2.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KGSB	C-130	3	35.5	11.8	10.0	6.5	19.0	12.5	6.4	41.6	0.05	7.3	4.5	19.1
KGSB	C-5	6	232.0	38.7	30.6	9.2	83.5	74.3	27.9	776.1	0.05	22.3	16.4	61.0
KGSB	KC-10	5	98.8	19.8	19.8	15.0	28.3	13.3	5.4	29.2	0.05	4.7	15.0	24.5

Location (ICAO)	Fleet (MDS)	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
KGSB	KC-135	6	313.1	52.2	44.6	4.3	107.8	103.5	42.2	1782.8	0.05	33.8	18.4	86.0
KGSP	C-130	1	23.0	23.0	23.0	23.0	23.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KGTB	C-130	1	11.5	11.5	11.5	11.5	11.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KGTB	C-17	1	40.5	40.5	40.5	40.5	40.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KGTB	C-5	4	130.1	32.5	24.7	20.3	60.5	40.2	18.8	354.3	0.05	18.4	14.1	51.0
KGTF	C-130	1	41.0	41.0	41.0	41.0	41.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KGTF	C-5	3	104.7	34.9	35.5	24.8	44.4	19.6	9.8	96.3	0.05	11.1	23.8	46.0
KGTF	KC-135	1	14.0	14.0	14.0	14.0	14.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KGYY	C-141	1	135.5	135.5	135.5	135.5	135.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KHIF	C-130	2	75.7	37.9	37.9	34.0	41.7	7.7	5.4	29.6	0.05	7.5	30.3	45.4
KHIF	C-141	5	253.8	50.8	45.3	14.0	106.7	92.7	34.0	1156.9	0.05	29.8	20.9	80.6
KHIF	C-17	3	60.0	20.0	21.2	15.3	23.5	8.2	4.2	17.9	0.05	4.8	15.2	24.8
KHIF	C-5	19	690.7	36.4	27.5	15.5	109.8	94.3	23.3	542.0	0.05	10.5	25.9	46.8
KHIF	KC-10	3	51.3	17.1	19.3	8.5	23.5	15.0	7.7	59.9	0.05	8.8	8.3	25.9
KHIF	KC-135	2	21.0	10.5	10.5	5.0	16.0	11.0	7.8	60.5	0.05	10.8	-0.3	21.3
KHMN	C-130	2	90.7	45.4	45.4	24.7	66.0	41.3	29.2	852.8	0.05	40.5	4.9	85.8
KHMN	C-5	4	116.8	29.2	30.6	10.9	44.7	33.8	14.0	196.0	0.05	13.7	15.5	42.9
KHMN	KC-10	3	70.4	23.5	13.7	12.8	43.9	31.1	17.7	313.3	0.05	20.0	3.4	43.5
KHOP	C-130	24	666.0	27.8	20.3	1.2	110.0	108.8	27.1	736.3	0.05	10.9	16.9	38.6
KHOP	C-141	4	243.4	60.9	65.7	19.3	92.8	73.5	30.6	933.4	0.05	29.9	30.9	90.8
KHOP	C-17	11	318.1	28.9	18.8	4.0	69.5	65.5	22.0	483.4	0.05	13.0	15.9	41.9
KHOP	C-5	57	1853.9	32.5	27.5	0.3	130.5	130.2	25.8	667.7	0.05	6.7	25.8	39.2
KHOP	KC-10	1	32.0	32.0	32.0	32.0	32.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KHRT	C-130	5	167.8	33.6	30.0	4.8	66.5	61.7	24.1	582.8	0.05	21.2	12.4	54.7
KHRT	C-141	1	77.3	77.3	77.3	77.3	77.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KHRT	C-17	3	70.8	23.6	14.2	1.3	55.3	54.0	28.2	795.3	0.05	31.9	-8.3	55.5
KHRT	C-5	27	1197.1	44.3	33.5	3.5	172.0	168.5	39.0	1524.2	0.05	14.7	29.6	59.1
KHRT	KC-10	2	44.5	22.3	22.3	19.5	25.0	5.5	3.9	15.1	0.05	5.4	16.9	27.6
KHRT	KC-135	3	72.8	24.3	19.5	13.8	39.5	25.7	13.5	182.2	0.05	15.3	9.0	39.5
KHSA	C-130	2	41.9	21.0	21.0	8.0	33.9	25.9	18.3	335.4	0.05	25.4	-4.4	46.3
KHSA	C-5	1	29.0	29.0	29.0	29.0	29.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KHST	C-130	1	44.0	44.0	44.0	44.0	44.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Location (ICAO)	Fleet (MDS)	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
KHST	C-141	2	86.3	43.2	43.2	12.8	73.5	60.7	42.9	1842.2	0.05	59.5	-16.3	102.6
KHST	C-5	3	94.0	31.3	23.7	5.0	65.3	60.3	30.9	952.7	0.05	34.9	-3.6	66.3
KHST	KC-10	1	31.5	31.5	31.5	31.5	31.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KHST	KC-135	3	134.4	44.8	34.9	19.7	79.8	60.1	31.2	976.5	0.05	35.4	9.4	80.2
KHTS	C-130	1	28.0	28.0	28.0	28.0	28.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KHUA	C-130	1	6.0	6.0	6.0	6.0	6.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KHUA	C-17	2	97.6	48.8	48.8	23.8	73.8	50.0	35.4	1250.0	0.05	49.0	-0.2	97.8
KHUA	C-5	1	23.3	23.3	23.3	23.3	23.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KHUF	C-130	1	42.5	42.5	42.5	42.5	42.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KIAB	C-130	1	21.0	21.0	21.0	21.0	21.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KIAB	C-141	1	94.0	94.0	94.0	94.0	94.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KIAB	C-5	3	58.5	19.5	23.0	9.5	26.0	16.5	8.8	77.3	0.05	9.9	9.6	29.4
KIAB	KC-10	6	115.6	19.3	20.9	1.0	35.0	34.0	11.9	140.8	0.05	9.5	9.8	28.8
KIAB	KC-135	4	40.9	10.2	3.0	0.5	34.4	33.9	16.2	261.8	0.05	15.9	-5.6	26.1
KIAD	C-141	1	4.5	4.5	4.5	4.5	4.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KIAD	KC-135	6	154.6	25.8	24.3	16.0	45.5	29.5	10.6	113.1	0.05	8.5	17.3	34.3
KIAG	C-130	3	36.3	12.1	8.5	3.3	24.5	21.2	11.0	122.1	0.05	12.5	-0.4	24.6
KIAG	C-5	1	20.0	20.0	20.0	20.0	20.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KIAG	KC-135	1	25.5	25.5	25.5	25.5	25.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KILG	C-130	2	69.5	34.8	34.8	5.0	64.5	59.5	42.1	1770.1	0.05	58.3	-23.6	93.1
KIND	C-130	2	8.8	4.4	4.4	1.3	7.5	6.2	4.4	19.2	0.05	6.1	-1.7	10.5
KIND	C-141	1	27.0	27.0	27.0	27.0	27.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KIND	C-5	1	22.7	22.7	22.7	22.7	22.7	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KINS	C-130	2	131.3	65.7	65.7	36.8	94.5	57.7	40.8	1664.6	0.05	56.5	9.1	122.2
KINT	C-130	1	5.0	5.0	5.0	5.0	5.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KIPL	C-130	1	52.0	52.0	52.0	52.0	52.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KIWA	C-130	1	16.7	16.7	16.7	16.7	16.7	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KIWA	C-17	1	32.0	32.0	32.0	32.0	32.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KIWA	C-5	1	20.9	20.9	20.9	20.9	20.9	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KIXD	C-130	1	45.5	45.5	45.5	45.5	45.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KJAC	C-141	2	92.4	46.2	46.2	23.3	69.1	45.8	32.4	1048.8	0.05	44.9	1.3	91.1
KJAN	C-141	1	161.8	161.8	161.8	161.8	161.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

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KJAX	C-130	1	6.8	6.8	6.8	6.8	6.8	0.0						
KJAX	C-141	2	48.1	24.1	24.1	11.6	36.5	24.9	17.6	310.0	0.05	24.4	-0.4	48.5
KJAX	KC-135	1	37.2	37.2	37.2	37.2	37.2	0.0						
KJFK	C-130	2	70.8	35.4	35.4	18.3	52.5	34.2	24.2	584.8	0.05	33.5	1.9	68.9
KJFK	C-141	2	21.4	10.7	10.7	10.6	10.8	0.2	0.1	0.0	0.05	0.2	10.5	10.9
KJFK	C-5	1	25.0	25.0	25.0	25.0	25.0	0.0						
KJLN	C-130	1	23.8	23.8	23.8	23.8	23.8	0.0						
KLAS	C-130	1	32.5	32.5	32.5	32.5	32.5	0.0						
KLAS	C-141	1	5.3	5.3	5.3	5.3	5.3	0.0						
KLAW	C-130	1	47.5	47.5	47.5	47.5	47.5	0.0						
KLAW	C-17	1	3.0	3.0	3.0	3.0	3.0	0.0						
KLAW	C-5	5	73.3	14.7	13.0	2.5	36.4	33.9	13.1	170.9	0.05	11.5	3.2	26.1
KLAX	C-141	1	5.4	5.4	5.4	5.4	5.4	0.0						
KLAX	C-5	6	303.4	50.6	26.7	15.3	150.5	135.2	52.1	2717.2	0.05	41.7	8.9	92.3
KLCK	C-130	1	88.5	88.5	88.5	88.5	88.5	0.0						
KLCK	C-17	1	46.5	46.5	46.5	46.5	46.5	0.0						
KLCK	C-5	1	13.0	13.0	13.0	13.0	13.0	0.0						
KLCK	KC-135	1	7.0	7.0	7.0	7.0	7.0	0.0						
KLFI	C-130	9	177.8	19.8	15.5	2.0	46.5	44.5	15.1	228.4	0.05	9.9	9.9	29.6
KLFI	C-141	4	140.2	35.1	23.8	16.0	76.7	60.7	28.0	784.9	0.05	27.5	7.6	62.5
KLFI	C-5	15	297.7	19.9	12.8	0.3	129.0	128.7	30.9	954.0	0.05	15.6	4.2	35.5
KLFI	KC-10	3	52.9	17.6	15.7	11.5	25.7	14.2	7.3	53.2	0.05	8.3	9.4	25.9
KLFI	KC-135	4	285.0	71.3	67.6	16.0	133.8	117.8	50.6	2556.3	0.05	49.5	21.7	120.8
KLFT	C-141	1	50.2	50.2	50.2	50.2	50.2							
KLGF	C-130	59	2956.7	50.1	34.8	2.0	300.0	298.0	51.5	2653.1	0.05	13.1	37.0	63.3
KLGF	C-141	1	19.8	19.8	19.8	19.8	19.8	0.0						
KLGF	C-17	10	251.7	25.2	28.5	1.3	51.8	50.5	17.6	308.2	0.05	10.9	14.3	36.1
KLIT	C-130	3	31.1	10.4	8.8	6.8	15.5	8.7	4.6	20.8	0.05	5.2	5.2	15.5
KLMT	KC-135	1	28.5	28.5	28.5	28.5	28.5	0.0						
KLNK	C-141	1	24.7	24.7	24.7	24.7	24.7	0.0						
KLNK	C-5	1	50.8	50.8	50.8	50.8	50.8	0.0						
KLRF	C-130	24	589.7	24.6	17.1	1.0	114.8	113.8	27.9	777.7	0.05	11.2	13.4	35.7

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KLRF	C-17	5	121.3	24.3	21.8	7.5	42.5	35.0	15.6	242.8	0.05	13.7	10.6	37.9
KLRF	C-5	2	46.9	23.5	23.5	23.4	23.5	0.1	0.1	0.0	0.05	0.1	23.4	23.5
KLRF	KC-135	1	42.3	42.3	42.3	42.3	42.3	0.0	[redacted]					
KLSE	C-5	1	56.5	56.5	56.5	56.5	56.5	0.0	[redacted]					
KLSF	C-130	138	5224.7	37.9	28.3	0.5	313.5	313.0	36.4	1327.5	0.05	6.1	31.8	43.9
KLSF	C-141	27	1069.9	39.6	23.5	6.5	197.2	190.7	40.8	1667.7	0.05	15.4	24.2	55.0
KLSF	C-17	14	354.4	25.3	20.3	7.4	75.0	67.6	19.9	396.4	0.05	10.4	14.9	35.7
KLSF	C-5	1	31.0	31.0	31.0	31.0	31.0	0.0	[redacted]					
KLSV	C-130	18	580.5	32.3	22.9	0.3	130.8	130.5	28.9	833.2	0.05	13.3	18.9	45.6
KLSV	C-141	10	239.7	24.0	21.8	3.9	66.8	62.9	18.4	337.3	0.05	11.4	12.6	35.4
KLSV	C-17	7	233.7	33.4	23.5	4.0	90.8	86.8	30.6	934.1	0.05	22.6	10.7	56.0
KLSV	C-5	17	475.6	28.0	24.0	11.0	54.3	43.3	12.4	154.4	0.05	5.9	22.1	33.9
KLSV	KC-10	18	393.4	21.9	19.2	5.6	64.0	58.4	13.4	178.7	0.05	6.2	15.7	28.0
KLSV	KC-135	25	912.7	36.5	26.7	1.0	158.0	157.0	33.8	1141.9	0.05	13.2	23.3	49.8
KLTS	C-141	5	138.2	27.6	26.7	10.5	55.0	44.5	17.2	296.1	0.05	15.1	12.6	42.7
KLTS	C-17	3	6.0	2.0	2.5	0.5	3.0	2.5	1.3	1.8	0.05	1.5	0.5	3.5
KLTS	C-5	8	188.3	23.5	9.7	1.0	106.5	105.5	35.5	1258.4	0.05	24.6	-1.0	48.1
KLTS	KC-10	1	5.8	5.8	5.8	5.8	5.8	0.0	[redacted]					
KLTS	KC-135	2	8.0	4.0	4.0	2.0	6.0	4.0	2.8	8.0	0.05	3.9	0.1	7.9
KLUF	C-130	3	129.6	43.2	43.2	42.8	43.6	0.8	0.4	0.2	0.05	0.5	42.7	43.7
KLUF	C-5	3	122.8	40.9	38.7	30.3	53.8	23.5	11.9	141.8	0.05	13.5	27.5	54.4
KLUF	KC-10	4	202.1	50.5	22.8	21.3	135.3	114.0	56.5	3194.6	0.05	55.4	-4.9	105.9
KLUF	KC-135	1	21.8	21.8	21.8	21.8	21.8	0.0	[redacted]					
KMAF	C-141	1	32.0	32.0	32.0	32.0	32.0	0.0	[redacted]					
KMCC	C-130	3	46.4	15.5	15.0	11.0	20.4	9.4	4.7	22.3	0.05	5.3	10.1	20.8
KMCF	C-130	15	604.0	40.3	38.3	2.2	87.5	85.3	23.6	555.7	0.05	11.9	28.3	52.2
KMCF	C-141	9	269.1	29.9	25.7	4.7	98.5	93.8	26.8	720.6	0.05	17.5	12.4	47.4
KMCF	C-17	5	86.5	17.3	15.5	2.0	40.2	38.2	14.0	196.4	0.05	12.3	5.0	29.6
KMCF	C-5	21	660.1	31.4	25.2	2.0	94.2	92.2	20.4	416.4	0.05	8.7	22.7	40.2
KMCF	KC-10	4	113.2	28.3	21.5	6.0	64.2	58.2	25.1	632.2	0.05	24.6	3.7	52.9
KMCF	KC-135	7	154.8	22.1	16.2	0.1	58.8	58.7	23.7	562.6	0.05	17.6	4.5	39.7
KMCI	C-130	1	21.1	21.1	21.1	21.1	21.1	0.0	[redacted]					

Location (ICAO)	Fleet (MDS)	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
KMCI	C-17	1	22.3	22.3	22.3	22.3	22.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMCO	C-130	1	44.3	44.3	44.3	44.3	44.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMCW	C-130	1	28.0	28.0	28.0	28.0	28.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMDT	C-17	1	22.7	22.7	22.7	22.7	22.7	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMDT	C-5	1	18.0	18.0	18.0	18.0	18.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMEI	C-141	1	1.7	1.7	1.7	1.7	1.7	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMEI	C-5	1	285.5	285.5	285.5	285.5	285.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMEM	C-130	2	42.5	21.3	21.3	15.5	27.0	11.5	8.1	66.1	0.05	11.3	10.0	32.5
KMER	KC-135	3	73.0	24.3	21.5	5.0	46.5	41.5	20.9	436.6	0.05	23.6	0.7	48.0
KMGE	C-130	8	101.5	12.7	12.7	0.5	26.4	25.9	10.4	107.7	0.05	7.2	5.5	19.9
KMGE	C-141	2	81.9	41.0	41.0	34.5	47.4	12.9	9.1	83.2	0.05	12.6	28.3	53.6
KMGE	C-5	4	120.7	30.2	18.1	13.3	71.2	57.9	27.4	753.2	0.05	26.9	3.3	57.1
KMGE	KC-135	1	5.2	5.2	5.2	5.2	5.2	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMGM	C-130	1	14.8	14.8	14.8	14.8	14.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMGM	C-5	2	145.3	72.7	72.7	38.0	107.3	69.3	49.0	2401.2	0.05	67.9	4.7	140.6
KMHT	C-130	1	60.3	60.3	60.3	60.3	60.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMHT	C-141	1	18.5	18.5	18.5	18.5	18.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMHT	C-5	1	38.0	38.0	38.0	38.0	38.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMIA	C-130	1	26.5	26.5	26.5	26.5	26.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMIA	C-141	2	96.4	48.2	48.2	27.6	68.8	41.2	29.1	848.7	0.05	40.4	7.8	88.6
KMIB	C-17	2	163.6	81.8	81.8	1.3	162.3	161.0	113.8	12960.5	0.05	157.8	-76.0	239.6
KMIB	KC-135	3	76.0	25.3	23.5	8.0	44.5	36.5	18.3	335.6	0.05	20.7	4.6	46.1
KMKE	C-130	1	175.0	175.0	175.0	175.0	175.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMKE	C-141	1	38.7	38.7	38.7	38.7	38.7	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMKE	C-17	1	26.0	26.0	26.0	26.0	26.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMKE	C-5	2	43.3	21.7	21.7	16.8	26.5	9.7	6.9	47.0	0.05	9.5	12.1	31.2
KMKE	KC-135	1	0.5	0.5	0.5	0.5	0.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMKO	C-130	1	54.0	54.0	54.0	54.0	54.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMLI	C-141	2	42.5	21.3	21.3	13.9	28.6	14.7	10.4	108.0	0.05	14.4	6.8	35.7
KMMT	C-17	1	16.2	16.2	16.2	16.2	16.2	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMMT	C-5	3	77.1	25.7	25.5	21.8	29.8	8.0	4.0	16.0	0.05	4.5	21.2	30.2
KMOT	C-130	1	25.5	25.5	25.5	25.5	25.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Location (ICAO)	Fleet (MDS)	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
KMRB	C-130	2	40.1	20.1	20.1	13.3	26.8	13.5	9.5	91.1	0.05	13.2	6.8	33.3
KMSP	C-130	3	76.4	25.5	25.2	1.0	50.2	49.2	24.6	605.2	0.05	27.8	-2.4	53.3
KMSP	C-17	2	33.5	16.8	16.8	9.0	24.5	15.5	11.0	120.1	0.05	15.2	1.6	31.9
KMSP	C-5	1	120.5	120.5	120.5	120.5	120.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMSY	C-130	2	103.8	51.9	51.9	8.0	95.8	87.8	62.1	3854.4	0.05	86.0	-34.1	137.9
KMSY	C-17	2	28.9	14.5	14.5	11.0	17.9	6.9	4.9	23.8	0.05	6.8	7.7	21.2
KMTC	C-130	2	135.0	67.5	67.5	48.5	86.5	38.0	26.9	722.0	0.05	37.2	30.3	104.7
KMTC	C-141	1	30.0	30.0	30.0	30.0	30.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMTC	C-17	1	19.0	19.0	19.0	19.0	19.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMTC	C-5	2	157.8	78.9	78.9	2.5	155.3	152.8	108.0	11673.9	0.05	149.7	-70.8	228.6
KMTC	KC-10	1	24.5	24.5	24.5	24.5	24.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMTC	KC-135	1	0.1	0.1	0.1	0.1	0.1	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMTN	C-130	3	161.8	53.9	62.0	21.0	78.8	57.8	29.7	884.0	0.05	33.6	20.3	87.6
KMUO	C-17	1	16.5	16.5	16.5	16.5	16.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMUO	C-5	9	315.0	35.0	21.5	18.4	87.6	69.2	27.0	727.5	0.05	17.6	17.4	52.6
KMUO	KC-10	1	45.0	45.0	45.0	45.0	45.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMUO	KC-135	1	35.5	35.5	35.5	35.5	35.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMWH	C-17	1	41.0	41.0	41.0	41.0	41.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMXF	C-130	1	38.4	38.4	38.4	38.4	38.4	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMYR	C-17	1	13.0	13.0	13.0	13.0	13.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KMZJ	C-130	2	35.3	17.7	17.7	9.3	26.0	16.7	11.8	139.4	0.05	16.4	1.3	34.0
KMZJ	C-141	1	42.3	42.3	42.3	42.3	42.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNBC	C-17	1	187.0	187.0	187.0	187.0	187.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNBC	KC-10	4	117.3	29.3	22.1	18.0	55.2	37.2	17.5	307.8	0.05	17.2	12.1	46.5
KNBC	KC-135	3	91.1	30.4	23.3	23.3	44.5	21.2	12.2	149.8	0.05	13.9	16.5	44.2
KNBG	C-130	2	93.0	46.5	46.5	20.5	72.5	52.0	36.8	1352.0	0.05	51.0	-4.5	97.5
KNBG	C-141	1	1.5	1.5	1.5	1.5	1.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNBG	C-17	1	38.3	38.3	38.3	38.3	38.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNBG	C-5	3	103.0	34.3	32.0	29.5	41.5	12.0	6.3	40.1	0.05	7.2	27.2	41.5
KNBG	KC-135	2	14.0	7.0	7.0	1.0	13.0	12.0	8.5	72.0	0.05	11.8	-4.8	18.8
KNCA	C-130	1	16.0	16.0	16.0	16.0	16.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNEL	C-130	2	93.8	46.9	46.9	44.8	49.0	4.2	3.0	8.8	0.05	4.1	42.8	51.0

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KNFG	C-5	4	136.5	34.1	30.0	19.6	57.0	37.4	16.1	260.0	0.05	15.8	18.3	49.9
KNFL	C-5	1	34.0	34.0	34.0	34.0	34.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNFW	C-130	4	125.3	31.3	22.8	0.4	79.4	79.0	34.0	1156.6	0.05	33.3	-2.0	64.7
KNFW	C-141	2	70.0	35.0	35.0	18.0	52.0	34.0	24.0	578.0	0.05	33.3	1.7	68.3
KNFW	C-5	1	25.0	25.0	25.0	25.0	25.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNFW	KC-10	2	52.5	26.3	26.3	20.2	32.3	12.1	8.6	73.2	0.05	11.9	14.4	38.1
KNFW	KC-135	5	96.9	19.4	20.3	11.6	26.7	15.1	6.6	43.1	0.05	5.8	13.6	25.1
KNGU	C-130	65	1983.9	30.5	22.2	1.3	118.0	116.7	23.0	528.8	0.05	5.6	24.9	36.1
KNGU	C-141	47	1256.8	26.7	20.5	0.4	139.6	139.2	25.1	629.5	0.05	7.2	19.6	33.9
KNGU	C-17	4	69.5	17.4	21.0	2.0	25.5	23.5	10.7	114.4	0.05	10.5	6.9	27.9
KNGU	C-5	87	1934.0	22.2	16.2	0.2	112.4	112.2	20.1	404.6	0.05	4.2	18.0	26.5
KNGU	KC-10	3	45.5	15.2	15.5	8.0	22.0	14.0	7.0	49.1	0.05	7.9	7.2	23.1
KNGU	KC-135	2	134.0	67.0	67.0	41.5	92.5	51.0	36.1	1300.5	0.05	50.0	17.0	117.0
KNHZ	C-130	1	28.8	28.8	28.8	28.8	28.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNHZ	C-17	1	47.8	47.8	47.8	47.8	47.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNHZ	C-5	1	20.3	20.3	20.3	20.3	20.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNID	KC-135	1	10.6	10.6	10.6	10.6	10.6	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNIP	C-130	9	238.9	26.5	21.5	11.8	52.8	41.0	14.2	201.8	0.05	9.3	17.3	35.8
KNIP	C-141	1	19.7	19.7	19.7	19.7	19.7	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNIP	C-5	2	89.3	44.7	44.7	24.0	65.3	41.3	29.2	852.8	0.05	40.5	4.2	85.1
KNKT	C-130	1	67.5	67.5	67.5	67.5	67.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNKT	C-141	1	25.6	25.6	25.6	25.6	25.6	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNKT	C-17	4	69.8	17.5	18.0	1.3	32.5	31.2	13.7	186.6	0.05	13.4	4.1	30.8
KNKT	C-5	29	945.2	32.6	24.5	4.8	105.2	100.4	23.0	528.1	0.05	8.4	24.2	41.0
KNKT	KC-10	4	116.8	29.2	24.8	13.7	53.5	39.8	17.7	313.8	0.05	17.4	11.8	46.6
KNKX	C-130	3	85.2	28.4	30.4	13.3	41.5	28.2	14.2	201.8	0.05	16.1	12.3	44.5
KNKX	C-141	4	78.6	19.7	22.7	2.8	30.5	27.7	12.0	143.0	0.05	11.7	7.9	31.4
KNKX	C-17	4	117.6	29.4	28.9	25.7	34.2	8.5	4.2	17.9	0.05	4.1	25.3	33.5
KNKX	C-5	18	577.0	32.1	24.0	0.2	145.5	145.3	32.6	1064.8	0.05	15.1	17.0	47.1
KNKX	KC-10	5	172.2	34.4	26.7	11.0	73.2	62.2	26.0	677.1	0.05	22.8	11.6	57.2
KNKX	KC-135	7	185.5	26.5	24.8	2.7	45.5	42.8	18.2	329.5	0.05	13.4	13.1	39.9
KNLC	C-5	1	22.0	22.0	22.0	22.0	22.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

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KNLC	KC-10	1	46.5	46.5	46.5	46.5	46.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNQX	C-130	10	325.5	32.6	25.6	2.1	81.0	78.9	25.9	670.0	0.05	16.0	16.5	48.6
KNQX	C-141	2	59.3	29.7	29.7	14.8	44.5	29.7	21.0	441.0	0.05	29.1	0.5	58.8
KNQX	KC-10	4	109.8	27.5	24.0	22.8	39.0	16.2	7.7	59.8	0.05	7.6	19.9	35.0
KNQX	KC-135	2	70.3	35.2	35.2	24.8	45.5	20.7	14.6	214.2	0.05	20.3	14.9	55.4
KNTD	C-130	8	194.1	24.3	22.4	5.5	45.5	40.0	15.0	225.7	0.05	10.4	13.8	34.7
KNTD	C-17	1	78.7	78.7	78.7	78.7	78.7	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNTD	C-5	4	148.8	37.2	37.0	20.2	54.6	34.4	18.9	357.4	0.05	18.5	18.7	55.7
KNTD	KC-135	1	30.5	30.5	30.5	30.5	30.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNTU	C-130	3	72.7	24.2	24.2	20.5	28.0	7.5	3.8	14.1	0.05	4.2	20.0	28.5
KNTU	C-141	5	149.5	29.9	21.5	14.3	48.5	34.2	15.4	235.9	0.05	13.5	16.4	43.4
KNTU	C-17	5	102.0	20.4	21.0	1.0	51.5	50.5	20.3	412.7	0.05	17.8	2.6	38.2
KNTU	C-5	4	75.0	18.8	17.3	13.0	27.5	14.5	6.6	43.8	0.05	6.5	12.3	25.2
KNTU	KC-10	1	16.0	16.0	16.0	16.0	16.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNUQ	C-130	2	57.2	28.6	28.6	17.5	39.7	22.2	15.7	246.4	0.05	21.8	6.8	50.4
KNUQ	C-17	1	19.5	19.5	19.5	19.5	19.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNUQ	C-5	8	69.7	8.7	6.8	4.8	15.8	11.0	4.0	16.2	0.05	2.8	5.9	11.5
KNUW	C-130	1	13.0	13.0	13.0	13.0	13.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNUW	C-141	2	74.2	37.1	37.1	30.2	44.0	13.8	9.8	95.2	0.05	13.5	23.6	50.6
KNUW	C-5	2	73.5	36.8	36.8	21.5	52.0	30.5	21.6	465.1	0.05	29.9	6.9	66.6
KNXX	C-17	1	1.0	1.0	1.0	1.0	1.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNXX	C-5	1	4.0	4.0	4.0	4.0	4.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNYG	C-130	15	494.9	33.0	22.0	2.3	140.2	137.9	37.3	1390.9	0.05	18.9	14.1	51.9
KNYG	C-17	3	142.0	47.3	30.5	7.5	104.0	96.5	50.4	2540.6	0.05	57.0	-9.7	104.4
KNZY	C-130	18	856.8	47.6	32.9	1.8	191.0	189.2	46.2	2135.6	0.05	21.3	26.3	68.9
KNZY	C-141	1	21.5	21.5	21.5	21.5	21.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KNZY	C-17	4	126.3	31.6	30.8	18.5	46.2	27.7	11.7	137.8	0.05	11.5	20.1	43.1
KNZY	C-5	32	1075.8	33.6	24.9	5.7	153.5	147.8	30.0	901.2	0.05	10.4	23.2	44.0
KOFF	C-130	1	29.4	29.4	29.4	29.4	29.4	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KOFF	C-141	2	255.3	127.7	127.7	60.0	195.3	135.3	95.7	9153.0	0.05	132.6	-4.9	260.2
KOFF	C-17	3	162.8	54.3	26.3	1.0	135.5	134.5	71.5	5109.2	0.05	80.9	-26.6	135.2
KOFF	C-5	7	271.0	38.7	27.9	12.8	89.5	76.7	26.4	696.1	0.05	19.5	19.2	58.3

Location (ICAO)	Fleet (MDS)	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
KOFF	KC-10	2	73.5	36.8	36.8	17.5	56.0	38.5	27.2	741.1	0.05	37.7	-1.0	74.5
KOKC	C-130	1	1.5	1.5	1.5	1.5	1.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KOKC	C-5	1	24.4	24.4	24.4	24.4	24.4	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KOPF	C-130	2	115.9	58.0	58.0	42.1	73.8	31.7	22.4	502.4	0.05	31.1	26.9	89.0
KOQU	C-130	7	381.8	54.5	52.9	0.2	97.9	97.7	34.0	1157.1	0.05	25.2	29.3	79.7
KOQU	C-5	1	5.5	5.5	5.5	5.5	5.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KORD	C-130	1	77.5	77.5	77.5	77.5	77.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KORD	C-17	1	42.9	42.9	42.9	42.9	42.9	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KPAE	C-5	1	58.5	58.5	58.5	58.5	58.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KPAM	C-17	1	19.5	19.5	19.5	19.5	19.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KPAM	C-5	2	85.3	42.7	42.7	33.0	52.3	19.3	13.6	186.2	0.05	18.9	23.7	61.6
KPAM	KC-10	9	227.3	25.3	20.0	1.3	82.8	81.5	23.0	529.0	0.05	15.0	10.2	40.3
KPAM	KC-135	2	47.8	23.9	23.9	22.5	25.3	2.8	2.0	3.9	0.05	2.7	21.2	26.6
KPBI	C-5	1	41.0	41.0	41.0	41.0	41.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KPDX	C-5	4	203.2	50.8	20.6	14.0	148.0	134.0	64.9	4213.2	0.05	63.6	-12.8	114.4
KPDX	KC-10	2	39.3	19.7	19.7	13.0	26.3	13.3	9.4	88.4	0.05	13.0	6.6	32.7
KPDX	KC-135	1	45.4	45.4	45.4	45.4	45.4	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KPHL	C-141	2	11.2	5.6	5.6	5.0	6.2	1.2	0.8	0.7	0.05	1.2	4.4	6.8
KPHL	C-17	1	5.0	5.0	5.0	5.0	5.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KPHL	KC-10	1	14.5	14.5	14.5	14.5	14.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KPHX	C-130	1	37.5	37.5	37.5	37.5	37.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KPHX	C-141	1	27.3	27.3	27.3	27.3	27.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KPHX	KC-135	1	25.7	25.7	25.7	25.7	25.7	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KPIE	C-5	1	52.5	52.5	52.5	52.5	52.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KPIT	C-130	1	15.5	15.5	15.5	15.5	15.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KPIT	C-5	1	26.0	26.0	26.0	26.0	26.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KPMD	C-5	1	15.5	15.5	15.5	15.5	15.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KPMD	KC-135	1	45.5	45.5	45.5	45.5	45.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KPOB	C-130	111	2697.7	24.3	15.5	0.2	223.1	222.9	29.8	888.3	0.05	5.5	18.8	29.8
KPOB	C-141	55	1259.7	22.9	16.3	0.5	107.0	106.5	21.4	459.6	0.05	5.7	17.2	28.6
KPOB	C-17	146	2231.1	15.3	12.6	0.5	121.5	121.0	15.3	232.7	0.05	2.5	12.8	17.8
KPOB	C-5	78	2793.1	35.8	24.6	0.2	264.5	264.3	41.5	1722.7	0.05	9.2	26.6	45.0

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KPOB	KC-10	8	153.5	19.2	20.3	7.0	26.5	19.5	7.4	54.4	0.05	5.1	14.1	24.3
KPOB	KC-135	2	22.0	11.0	11.0	0.5	21.5	21.0	14.8	220.5	0.05	20.6	-9.6	31.6
KPOE	C-130	2	25.5	12.8	12.8	4.0	21.5	17.5	12.4	153.1	0.05	17.1	-4.4	29.9
KPSM	C-130	2	74.3	37.2	37.2	2.0	72.3	70.3	49.7	2471.0	0.05	68.9	-31.7	106.0
KPSM	C-5	1	6.7	6.7	6.7	6.7	6.7	0.0						
KPSM	KC-10	5	486.8	97.4	37.0	18.5	272.5	254.0	108.6	11802.3	0.05	95.2	2.1	192.6
KPSM	KC-135	16	613.1	38.3	25.0	4.5	159.5	155.0	38.7	1501.0	0.05	19.0	19.3	57.3
KPVD	C-141	1	4.0	4.0	4.0	4.0	4.0	0.0						
KRCA	C-130	1	38.0	38.0	38.0	38.0	38.0	0.0						
KRCA	C-17	1	9.0	9.0	9.0	9.0	9.0	0.0						
KRCA	C-5	1	26.0	26.0	26.0	26.0	26.0	0.0						
KRCA	KC-10	2	79.5	39.8	39.8	38.7	40.8	2.1	1.5	2.2	0.05	2.1	37.7	41.8
KRCA	KC-135	4	117.9	29.5	36.8	0.8	43.5	42.7	19.9	397.8	0.05	19.5	9.9	49.0
KRDR	C-130	1	33.0	33.0	33.0	33.0	33.0	0.0						
KRDR	C-141	1	22.5	22.5	22.5	22.5	22.5	0.0						
KRDR	C-17	1	24.0	24.0	24.0	24.0	24.0	0.0						
KRDR	C-5	3	95.5	31.8	26.7	25.3	43.5	18.2	10.1	102.6	0.05	11.5	20.4	43.3
KRDR	KC-10	1	97.5	97.5	97.5	97.5	97.5	0.0						
KRDR	KC-135	1	47.7	47.7	47.7	47.7	47.7	0.0						
KRIC	C-5	2	43.2	21.6	21.6	13.0	30.2	17.2	12.2	147.9	0.05	16.9	4.7	38.5
KRIV	C-130	2	51.5	25.8	25.8	24.5	27.0	2.5	1.8	3.1	0.05	2.5	23.3	28.2
KRIV	C-141	2	76.2	38.1	38.1	4.5	71.7	67.2	47.5	2257.9	0.05	65.9	-27.8	104.0
KRIV	C-17	9	293.5	32.6	21.0	6.0	76.3	70.3	27.3	743.9	0.05	17.8	14.8	50.4
KRIV	C-5	38	996.2	26.2	21.5	2.2	92.5	90.3	20.0	399.3	0.05	6.4	19.9	32.6
KRIV	KC-10	4	72.5	18.1	11.9	5.0	43.7	38.7	17.5	306.9	0.05	17.2	1.0	35.3
KRIV	KC-135	5	143.0	28.6	20.2	4.5	52.8	48.3	22.0	484.4	0.05	19.3	9.3	47.9
KRND	C-130	1	24.5	24.5	24.5	24.5	24.5	0.0						
KRNO	C-130	8	530.3	66.3	66.0	6.5	172.8	166.3	51.9	2693.7	0.05	36.0	30.3	102.3
KRNO	C-141	1	31.4	31.4	31.4	31.4	31.4	0.0						
KRNO	C-17	1	19.0	19.0	19.0	19.0	19.0	0.0						
KRNO	C-5	4	161.5	40.4	29.5	11.0	91.5	80.5	36.1	1304.4	0.05	35.4	5.0	75.8
KROC	C-5	1	26.5	26.5	26.5	26.5	26.5	0.0						

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KROW	C-5	1	28.5	28.5	28.5	28.5	28.5	0.0						
KRST	C-17	2	107.0	53.5	53.5	50.0	57.0	7.0	5.0	24.5	0.05	6.9	46.6	60.4
KSAT	C-141	1	55.5	55.5	55.5	55.5	55.5	0.0						
KSAV	C-141	3	36.8	12.3	10.0	0.5	26.3	25.8	13.0	170.3	0.05	14.8	-2.5	27.0
KSBN	C-130	1	35.7	35.7	35.7	35.7	35.7	0.0						
KSCH	C-141	1	12.3	12.3	12.3	12.3	12.3	0.0						
KSDF	C-17	2	7.5	3.8	3.8	2.5	5.0	2.5	1.8	3.1	0.05	2.5	1.3	6.2
KSDF	C-5	3	86.9	29.0	28.5	12.6	45.8	33.2	16.6	275.7	0.05	18.8	10.2	47.8
KSDF	KC-10	1	2.0	2.0	2.0	2.0	2.0	0.0						
KSDM	C-130	6	131.6	21.9	24.7	4.7	27.0	22.3	8.6	73.3	0.05	6.9	15.1	28.8
KSEA	C-130	1	96.5	96.5	96.5	96.5	96.5	0.0						
KSEA	C-141	1	61.5	61.5	61.5	61.5	61.5	0.0						
KSFO	C-141	1	19.8	19.8	19.8	19.8	19.8	0.0						
KSFO	C-5	1	7.5	7.5	7.5	7.5	7.5	0.0						
KSGF	C-5	1	27.0	27.0	27.0	27.0	27.0	0.0						
KSHV	C-5	2	37.7	18.9	18.9	18.3	19.4	1.1	0.8	0.6	0.05	1.1	17.8	19.9
KSKA	C-130	1	24.6	24.6	24.6	24.6	24.6	0.0						
KSKA	C-141	1	31.0	31.0	31.0	31.0	31.0	0.0						
KSKA	C-5	3	77.5	25.8	25.8	1.7	50.0	48.3	24.2	583.2	0.05	27.3	-1.5	53.2
KSKA	KC-135	5	139.7	27.9	27.8	0.5	73.4	72.9	28.1	790.0	0.05	24.6	3.3	52.6
KSKF	C-130	4	181.1	45.3	47.6	23.0	63.0	40.0	16.5	273.6	0.05	16.2	29.1	61.5
KSKF	C-141	4	130.5	32.6	28.3	2.0	72.0	70.0	29.5	868.2	0.05	28.9	3.8	61.5
KSKF	C-17	2	20.9	10.5	10.5	6.1	14.8	8.7	6.2	37.8	0.05	8.5	1.9	19.0
KSKF	C-5	9	123.3	13.7	17.5	4.5	23.1	18.6	7.5	55.5	0.05	4.9	8.8	18.6
KSKF	KC-10	3	89.1	29.7	6.0	3.3	79.8	76.5	43.4	1884.3	0.05	49.1	-19.4	78.8
KSKF	KC-135	5	135.3	27.1	23.3	13.3	55.2	41.9	16.4	268.9	0.05	14.4	12.7	41.4
KSLC	C-130	9	302.4	33.6	37.2	9.5	67.2	57.7	18.6	347.2	0.05	12.2	21.4	45.8
KSLC	C-17	1	21.0	21.0	21.0	21.0	21.0	0.0						
KSLI	C-141	2	26.7	13.4	13.4	5.7	21.0	15.3	10.8	117.0	0.05	15.0	-1.6	28.3
KSLI	C-17	1	19.3	19.3	19.3	19.3	19.3	0.0						
KSLI	C-5	3	72.5	24.2	20.0	5.7	46.8	41.1	20.9	435.3	0.05	23.6	0.6	47.8
KSMF	C-141	1	20.3	20.3	20.3	20.3	20.3	0.0						

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KSRQ	C-141	1	26.7	26.7	26.7	26.7	26.7	0.0						
KSSC	C-141	2	18.3	9.2	9.2	5.2	13.1	7.9	5.6	31.2	0.05	7.7	1.4	16.9
KSSC	C-17	2	19.3	9.7	9.7	5.5	13.8	8.3	5.9	34.4	0.05	8.1	1.5	17.8
KSSC	KC-10	2	58.6	29.3	29.3	16.3	42.3	26.0	18.4	338.0	0.05	25.5	3.8	54.8
KSSC	KC-135	2	31.3	15.7	15.7	13.5	17.8	4.3	3.0	9.2	0.05	4.2	11.4	19.9
KSTJ	C-130	2	45.3	22.7	22.7	5.8	39.5	33.7	23.8	567.8	0.05	33.0	-10.4	55.7
KSTL	C-130	2	83.3	41.7	41.7	13.8	69.5	55.7	39.4	1551.2	0.05	54.6	-12.9	96.2
KSTL	C-141	1	54.8	54.8	54.8	54.8	54.8	0.0						
KSTL	C-17	1	65.7	65.7	65.7	65.7	65.7	0.0						
KSTL	C-5	4	173.8	43.5	40.8	22.5	69.8	47.3	22.0	482.6	0.05	21.5	21.9	65.0
KSUU	C-130	32	1256.6	39.3	33.0	2.0	122.7	120.7	25.6	655.4	0.05	8.9	30.4	48.1
KSUU	C-141	120	2756.1	23.0	18.5	0.3	148.0	147.7	24.0	576.8	0.05	4.3	18.7	27.3
KSUU	C-17	60	1663.2	27.7	19.5	0.2	191.0	190.8	31.9	1017.0	0.05	8.1	19.7	35.8
KSUU	C-5	139	2767.5	19.9	9.5	0.2	245.8	245.6	33.1	1097.0	0.05	5.5	14.4	25.4
KSUU	KC-10	19	472.6	24.9	12.5	1.8	117.0	115.2	29.1	844.8	0.05	13.1	11.8	37.9
KSUU	KC-135	66	1911.3	29.0	23.5	0.3	92.3	92.0	19.5	379.0	0.05	4.7	24.3	33.7
KSUX	C-141	1	32.3	32.3	32.3	32.3	32.3	0.0						
KSUX	C-5	1	12.5	12.5	12.5	12.5	12.5	0.0						
KSVN	C-130	1	11.0	11.0	11.0	11.0	11.0	0.0						
KSVN	C-141	6	91.6	15.3	20.8	0.5	25.5	25.0	11.7	136.2	0.05	9.3	5.9	24.6
KSVN	C-17	12	124.5	10.4	10.4	0.5	18.0	17.5	5.4	29.3	0.05	3.1	7.3	13.4
KSVN	C-5	32	1477.7	46.2	25.7	7.5	257.8	250.3	53.0	2808.0	0.05	18.4	27.8	64.5
KSVN	KC-10	2	51.5	25.8	25.8	25.0	26.5	1.5	1.1	1.1	0.05	1.5	24.3	27.2
KSVN	KC-135	1	67.5	67.5	67.5	67.5	67.5	0.0						
KSWF	C-17	1	17.5	17.5	17.5	17.5	17.5	0.0						
KSWF	C-5	11	688.9	62.6	49.4	0.2	225.4	225.2	70.5	4974.4	0.05	41.7	21.0	104.3
KSWF	KC-10	1	13.0	13.0	13.0	13.0	13.0	0.0						
KSWF	KC-135	1	33.2	33.2	33.2	33.2	33.2	0.0						
KSYR	C-141	1	17.3	17.3	17.3	17.3	17.3	0.0						
KSYR	C-5	1	39.0	39.0	39.0	39.0	39.0	0.0						
KSZL	C-141	2	85.9	43.0	43.0	38.9	47.0	8.1	5.7	32.8	0.05	7.9	35.0	50.9
KSZL	C-5	1	113.8	113.8	113.8	113.8	113.8	0.0						

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KSZL	KC-10	1	5.8	5.8	5.8	5.8	5.8	0.0						
KSZL	KC-135	3	11.1	3.7	1.0	1.0	9.1	8.1	4.7	21.9	0.05	5.3	-1.6	9.0
KTCM	C-130	29	1023.7	35.3	28.2	0.2	79.0	78.8	24.1	581.8	0.05	8.8	26.5	44.1
KTCM	C-141	48	744.1	15.5	9.5	0.2	144.0	143.8	22.3	496.9	0.05	6.3	9.2	21.8
KTCM	C-17	37	682.4	18.4	7.0	0.1	94.8	94.7	24.1	582.0	0.05	7.8	10.7	26.2
KTCM	C-5	24	683.0	28.5	21.8	10.7	75.8	65.1	16.8	280.9	0.05	6.7	21.8	35.2
KTCM	KC-10	5	67.1	13.4	12.5	0.7	28.8	28.1	10.1	102.5	0.05	8.9	4.5	22.3
KTCM	KC-135	18	405.8	22.5	21.0	10.0	62.5	52.5	12.2	148.9	0.05	5.6	16.9	28.2
KTIK	C-130	2	26.5	13.3	13.3	4.0	22.5	18.5	13.1	171.1	0.05	18.1	-4.9	31.4
KTIK	C-141	1	31.7	31.7	31.7	31.7	31.7	0.0						
KTIK	C-17	1	42.0	42.0	42.0	42.0	42.0	0.0						
KTIK	C-5	3	337.6	112.5	16.3	6.5	314.8	308.3	175.2	30707.9	0.05	198.3	-85.8	310.8
KTIK	KC-10	7	228.1	32.6	24.0	15.0	58.5	43.5	16.3	264.1	0.05	12.0	20.6	44.6
KTIK	KC-135	2	95.8	47.9	47.9	0.5	95.3	94.8	67.0	4493.5	0.05	92.9	-45.0	140.8
KTNX	C-141	2	96.0	48.0	48.0	40.8	55.2	14.4	10.2	103.7	0.05	14.1	33.9	62.1
KTNX	C-17	2	40.8	20.4	20.4	15.3	25.5	10.2	7.2	52.0	0.05	10.0	10.4	30.4
KTOL	C-141	1	26.0	26.0	26.0	26.0	26.0	0.0						
KTPA	C-130	2	65.5	32.8	32.8	23.8	41.7	17.9	12.7	160.2	0.05	17.5	15.2	50.3
KTPA	C-141	1	21.0	21.0	21.0	21.0	21.0	0.0						
KTPA	C-5	1	18.0	18.0	18.0	18.0	18.0	0.0						
KTUL	C-5	1	6.5	6.5	6.5	6.5	6.5	0.0						
KTVC	C-17	1	31.0	31.0	31.0	31.0	31.0	0.0						
KTYS	C-130	2	193.0	96.5	96.5	65.0	128.0	63.0	44.5	1984.5	0.05	61.7	34.8	158.2
KTYS	C-5	1	18.0	18.0	18.0	18.0	18.0	0.0						
KUIN	C-141	1	32.4	32.4	32.4	32.4	32.4	0.0						
KVAD	C-130	1	20.5	20.5	20.5	20.5	20.5	0.0						
KVAD	C-5	8	378.3	47.3	24.5	18.0	171.3	153.3	52.3	2738.0	0.05	36.3	11.0	83.5
KVBG	C-5	3	72.3	24.1	24.8	18.5	29.0	10.5	5.3	27.9	0.05	6.0	18.1	30.1
KVBG	KC-10	1	26.7	26.7	26.7	26.7	26.7	0.0						
KVBG	KC-135	3	54.6	18.2	17.0	12.0	25.6	13.6	6.9	47.3	0.05	7.8	10.4	26.0
KVCV	C-130	3	107.0	35.7	28.5	27.2	51.3	24.1	13.6	183.7	0.05	15.3	20.3	51.0
KVCV	C-5	8	270.0	33.8	26.6	21.0	67.8	46.8	16.6	275.3	0.05	11.5	22.3	45.2

Location (ICAO)	Fleet (MDS)	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
KVCV	KC-10	4	101.7	25.4	19.8	9.0	53.2	44.2	20.1	403.6	0.05	19.7	5.7	45.1
KVOK	C-17	9	293.4	32.6	23.8	2.2	105.5	103.3	32.3	1044.1	0.05	21.1	11.5	53.7
KVOK	C-5	1	25.2	25.2	25.2	25.2	25.2	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KVOK	KC-135	1	17.5	17.5	17.5	17.5	17.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KVPS	C-130	3	45.4	15.1	20.3	2.3	22.8	20.5	11.2	125.1	0.05	12.7	2.5	27.8
KVPS	C-141	2	109.7	54.9	54.9	48.7	61.0	12.3	8.7	75.6	0.05	12.1	42.8	66.9
KVPS	C-17	4	133.5	33.4	35.3	22.0	41.0	19.0	8.8	76.9	0.05	8.6	24.8	42.0
KVPS	C-5	11	354.5	32.2	29.0	0.9	75.0	74.1	19.1	366.6	0.05	11.3	20.9	43.5
KVPS	KC-10	9	166.3	18.5	20.3	3.5	26.6	23.1	7.5	55.7	0.05	4.9	13.6	23.4
KVPS	KC-135	25	644.9	25.8	21.3	2.3	114.5	112.2	23.9	570.3	0.05	9.4	16.4	35.2
KWRB	C-130	3	42.4	14.1	3.5	3.3	35.6	32.3	18.6	345.6	0.05	21.0	-6.9	35.2
KWRB	C-141	1	53.0	53.0	53.0	53.0	53.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KWRB	C-5	13	586.6	45.1	14.0	1.8	413.8	412.0	111.6	12453.6	0.05	60.7	-15.5	105.8
KWRB	KC-135	8	141.3	17.7	3.5	0.3	48.0	47.7	22.2	494.1	0.05	15.4	2.3	33.1
KWRI	C-130	24	906.1	37.8	28.2	1.0	119.5	118.5	31.2	973.7	0.05	12.5	25.3	50.2
KWRI	C-141	86	1454.4	16.9	9.7	0.1	231.2	231.1	30.1	904.7	0.05	6.4	10.6	23.3
KWRI	C-17	38	787.1	20.7	19.9	0.5	59.2	58.7	14.5	209.1	0.05	4.6	16.1	25.3
KWRI	C-5	38	762.2	20.1	13.6	0.9	115.6	114.7	20.3	411.5	0.05	6.4	13.6	26.5
KWRI	KC-10	31	979.3	31.6	7.7	0.3	271.8	271.5	60.8	3699.3	0.05	21.4	10.2	53.0
KWRI	KC-135	10	218.1	21.8	17.0	4.3	54.5	50.2	17.3	298.4	0.05	10.7	11.1	32.5
KX68	C-17	1	34.8	34.8	34.8	34.8	34.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KX69	C-5	1	24.8	24.8	24.8	24.8	24.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KXMR	C-5	18	969.0	53.8	40.4	16.5	166.5	150.0	40.9	1675.9	0.05	18.9	34.9	72.7
KXNO	C-17	1	19.0	19.0	19.0	19.0	19.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KYUM	C-130	3	258.2	86.1	54.0	51.7	152.5	100.8	57.5	3311.4	0.05	65.1	21.0	151.2
KYUM	C-141	1	21.8	21.8	21.8	21.8	21.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
KYUM	C-5	2	56.0	28.0	28.0	26.5	29.5	3.0	2.1	4.5	0.05	2.9	25.1	30.9
KYUM	KC-10	8	167.7	21.0	22.5	3.3	29.3	26.0	8.1	65.8	0.05	5.6	15.3	26.6
LBBG	C-17	1	20.0	20.0	20.0	20.0	20.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
LBBG	C-5	1	68.0	68.0	68.0	68.0	68.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
LCLK	C-17	1	38.7	38.7	38.7	38.7	38.7	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
LCRA	C-5	1	296.2	296.2	296.2	296.2	296.2	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Location (ICAO)	Fleet (MDS)	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
LCRA	KC-135	8	602.4	75.3	61.8	2.3	166.0	163.7	55.1	3030.6	0.05	38.1	37.2	113.4
LDSP	C-141	1	4.4	4.4	4.4	4.4	4.4	0.0	[redacted]					
LEMG	C-5	1	2.5	2.5	2.5	2.5	2.5	0.0	[redacted]					
LEMO	C-130	2	214.3	107.2	107.2	95.0	119.3	24.3	17.2	295.2	0.05	23.8	83.3	131.0
LEMO	C-141	13	330.6	25.4	14.5	0.3	94.5	94.2	25.5	652.5	0.05	13.9	11.5	39.3
LEMO	C-17	28	1508.6	53.9	27.7	0.1	332.0	331.9	69.9	4886.7	0.05	25.9	28.0	79.8
LEMO	C-5	492	12497.7	25.4	13.5	0.2	262.5	262.3	32.5	1058.0	0.05	2.9	22.5	28.3
LEMO	KC-10	41	1525.4	37.2	34.8	1.5	106.0	104.5	23.5	553.0	0.05	7.2	30.0	44.4
LEMO	KC-135	64	4432.8	69.3	48.5	0.6	287.0	286.4	65.1	4235.9	0.05	15.9	53.3	85.2
LERS	C-17	1	17.4	17.4	17.4	17.4	17.4	0.0	[redacted]					
LERT	C-130	9	537.7	59.7	65.0	1.5	140.1	138.6	40.9	1672.7	0.05	26.7	33.0	86.5
LERT	C-141	57	1885.2	33.1	24.9	0.3	254.5	254.2	38.0	1444.8	0.05	9.9	23.2	42.9
LERT	C-17	26	1323.4	50.9	38.5	0.8	285.1	284.3	60.2	3625.4	0.05	23.1	27.8	74.0
LERT	C-5	559	17490.1	31.3	18.5	0.3	443.5	443.2	42.7	1827.2	0.05	3.5	27.7	34.8
LERT	KC-10	23	1453.8	63.2	44.0	1.3	253.5	252.2	60.6	3668.5	0.05	24.8	38.5	88.0
LERT	KC-135	11	603.4	54.9	46.7	6.0	161.7	155.7	39.7	1575.4	0.05	23.5	31.4	78.3
LETO	C-17	1	48.8	48.8	48.8	48.8	48.8	0.0	[redacted]					
LETO	C-5	2	68.8	34.4	34.4	17.5	51.3	33.8	23.9	571.2	0.05	33.1	1.3	67.5
LEZG	C-5	2	85.3	42.7	42.7	8.0	77.3	69.3	49.0	2401.2	0.05	67.9	-25.3	110.6
LFBM	C-17	1	27.5	27.5	27.5	27.5	27.5	0.0	[redacted]					
LFBM	C-5	1	42.5	42.5	42.5	42.5	42.5	0.0	[redacted]					
LFMI	C-17	2	177.3	88.7	88.7	32.0	145.3	113.3	80.1	6418.4	0.05	111.0	-22.4	199.7
LFMI	KC-135	3	44.3	14.8	17.8	2.0	24.5	22.5	11.6	133.5	0.05	13.1	1.7	27.8
LFMN	C-130	1	109.5	109.5	109.5	109.5	109.5	0.0	[redacted]					
LFPB	C-17	1	4.0	4.0	4.0	4.0	4.0	0.0	[redacted]					
LFPB	C-5	1	19.0	19.0	19.0	19.0	19.0	0.0	[redacted]					
LGSA	C-130	51	3843.4	75.4	67.0	0.3	240.5	240.2	60.9	3711.1	0.05	16.7	58.6	92.1
LGSA	C-141	7	312.0	44.6	27.7	3.0	105.4	102.4	34.9	1220.5	0.05	25.9	18.7	70.5
LGSA	C-17	8	332.5	41.6	36.5	15.3	70.5	55.2	19.3	370.8	0.05	13.3	28.2	54.9
LGSA	KC-135	12	1019.7	85.0	56.4	1.0	327.8	326.8	88.4	7821.3	0.05	50.0	34.9	135.0
LHKE	C-17	1	5.0	5.0	5.0	5.0	5.0	0.0	[redacted]					
LIBR	C-141	1	48.0	48.0	48.0	48.0	48.0	0.0	[redacted]					

Location (ICAO)	Fleet (MDS)	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
LIBR	C-17	1	32.0	32.0	32.0	32.0	32.0	0.0						
LIBR	C-5	1	49.8	49.8	49.8	49.8	49.8	0.0						
LICT	C-17	1	13.2	13.2	13.2	13.2	13.2	0.0						
LICZ	C-130	18	946.3	52.6	23.5	0.5	188.0	187.5	60.4	3645.1	0.05	27.9	24.7	80.5
LICZ	C-141	54	1956.5	36.2	25.5	0.5	237.5	237.0	44.3	1964.8	0.05	11.8	24.4	48.1
LICZ	C-17	91	3007.8	33.1	23.8	0.7	320.8	320.1	42.0	1766.3	0.05	8.6	24.4	41.7
LICZ	C-5	151	7911.4	52.4	37.8	0.5	324.8	324.3	51.9	2689.9	0.05	8.3	44.1	60.7
LICZ	KC-10	11	774.7	70.4	60.5	2.3	201.0	198.7	56.4	3179.1	0.05	33.3	37.1	103.7
LICZ	KC-135	8	428.7	53.6	53.5	23.5	80.0	56.5	21.4	458.6	0.05	14.8	38.8	68.4
LIMJ	C-5	1	7.8	7.8	7.8	7.8	7.8	0.0						
LIMN	C-17	1	69.0	69.0	69.0	69.0	69.0	0.0						
LIPA	C-130	6	151.7	25.3	12.5	0.5	97.0	96.5	36.2	1313.9	0.05	29.0	-3.7	54.3
LIPA	C-141	4	58.6	14.7	15.1	2.5	26.0	23.5	10.5	110.6	0.05	10.3	4.3	25.0
LIPA	C-17	8	435.4	54.4	34.3	24.1	176.0	151.9	51.1	2612.9	0.05	35.4	19.0	89.9
LIPA	C-5	26	1540.1	59.2	30.3	3.7	398.0	394.3	80.9	6549.8	0.05	31.1	28.1	90.3
LIPA	KC-10	1	43.2	43.2	43.2	43.2	43.2	0.0						
LIPA	KC-135	4	146.4	36.6	33.7	2.5	76.5	74.0	32.5	1054.5	0.05	31.8	4.8	68.4
LIRA	C-17	1	33.0	33.0	33.0	33.0	33.0	0.0						
LIRN	C-130	3	118.3	39.4	37.0	19.5	61.8	42.3	21.3	451.8	0.05	24.1	15.4	63.5
LIRN	C-141	4	213.8	53.5	52.2	11.0	98.5	87.5	39.7	1576.5	0.05	38.9	14.5	92.4
LIRN	C-17	1	15.0	15.0	15.0	15.0	15.0	0.0						
LIRN	C-5	6	207.1	34.5	26.4	10.5	83.3	72.8	25.9	671.4	0.05	20.7	13.8	55.3
LIRN	KC-10	1	47.0	47.0	47.0	47.0	47.0	0.0						
LIRP	C-141	1	64.8	64.8	64.8	64.8	64.8	0.0						
LIRP	C-17	3	85.3	28.4	9.5	0.3	75.5	75.2	41.0	1682.6	0.05	46.4	-18.0	74.8
LKPR	C-17	1	29.0	29.0	29.0	29.0	29.0	0.0						
LKPR	C-5	1	15.3	15.3	15.3	15.3	15.3	0.0						
LLBG	C-17	1	54.2	54.2	54.2	54.2	54.2	0.0						
LLBG	C-5	1	16.8	16.8	16.8	16.8	16.8	0.0						
LPBG	C-130	1	352.0	352.0	352.0	352.0	352.0	0.0						
LPLA	C-130	24	1033.1	43.1	30.3	0.1	171.0	170.9	51.2	2624.8	0.05	20.5	22.6	63.5
LPLA	C-141	29	1549.0	53.4	27.3	0.2	278.5	278.3	63.7	4056.9	0.05	23.2	30.2	76.6

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LPLA	C-17	16	674.1	42.1	29.8	1.7	142.6	140.9	38.6	1492.3	0.05	18.9	23.2	61.1
LPLA	C-5	22	1498.9	68.1	58.4	2.5	246.5	244.0	61.5	3777.5	0.05	25.7	42.4	93.8
LPLA	KC-10	12	645.8	53.8	58.9	3.0	115.5	112.5	35.8	1285.1	0.05	20.3	33.5	74.1
LPLA	KC-135	19	1124.3	59.2	48.8	1.9	198.3	196.4	51.9	2688.7	0.05	23.3	35.9	82.5
LPPT	KC-135	1	35.0	35.0	35.0	35.0	35.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
LRCK	C-130	1	9.5	9.5	9.5	9.5	9.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
LROP	C-130	1	59.0	59.0	59.0	59.0	59.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
LTAC	C-17	1	52.2	52.2	52.2	52.2	52.2	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
LTAG	C-130	20	869.1	43.5	19.9	0.5	164.5	164.0	48.9	2388.2	0.05	21.4	22.0	64.9
LTAG	C-141	14	831.0	59.4	63.3	6.3	146.0	139.7	41.4	1713.6	0.05	21.7	37.7	81.0
LTAG	C-17	129	4788.1	37.1	21.8	0.5	242.0	241.5	46.3	2139.7	0.05	8.0	29.1	45.1
LTAG	C-5	51	2227.9	43.7	28.6	1.2	427.0	425.8	65.2	4255.6	0.05	17.9	25.8	61.6
LTAG	KC-10	1	3.3	3.3	3.3	3.3	3.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
LTAG	KC-135	95	6448.5	67.9	56.0	0.3	385.3	385.0	67.2	4510.8	0.05	13.5	54.4	81.4
LTAI	C-17	1	33.7	33.7	33.7	33.7	33.7	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
LTBA	C-17	1	27.4	27.4	27.4	27.4	27.4	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
LWSK	KC-10	1	36.0	36.0	36.0	36.0	36.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
LYPR	C-141	1	42.8	42.8	42.8	42.8	42.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
MBGT	C-130	1	146.5	146.5	146.5	146.5	146.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
MDSD	C-141	2	95.1	47.6	47.6	26.7	68.4	41.7	29.5	869.4	0.05	40.9	6.7	88.4
MDSI	C-130	1	30.9	30.9	30.9	30.9	30.9	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
MGGT	C-130	2	171.7	85.9	85.9	68.7	103.0	34.3	24.3	588.2	0.05	33.6	52.2	119.5
MHLM	C-17	1	26.0	26.0	26.0	26.0	26.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
MHSC	C-130	7	331.7	47.4	48.0	5.9	90.1	84.2	29.9	894.2	0.05	22.2	25.2	69.5
MHSC	C-5	4	81.6	20.4	20.5	15.2	25.5	10.3	4.4	19.1	0.05	4.3	16.1	24.7
MHSC	KC-10	1	26.9	26.9	26.9	26.9	26.9	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
MHTG	C-130	1	50.7	50.7	50.7	50.7	50.7	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
MKJP	C-130	3	215.8	71.9	71.0	44.5	100.3	55.8	27.9	779.1	0.05	31.6	40.3	103.5
MKJP	C-141	1	29.8	29.8	29.8	29.8	29.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
MMAN	C-130	1	148.9	148.9	148.9	148.9	148.9	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
MMMX	C-17	1	25.1	25.1	25.1	25.1	25.1	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
MMUN	C-141	1	78.5	78.5	78.5	78.5	78.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Location (ICAO)	Fleet (MDS)	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
MNMG	C-141	1	76.7	76.7	76.7	76.7	76.7	0.0						
MNMG	C-5	1	50.5	50.5	50.5	50.5	50.5	0.0						
MPTO	C-130	8	754.1	94.3	80.0	46.4	191.7	145.3	45.1	2038.1	0.05	31.3	63.0	125.5
MPTO	C-141	1	80.2	80.2	80.2	80.2	80.2	0.0						
MPTO	C-5	1	141.3	141.3	141.3	141.3	141.3	0.0						
MROC	C-130	2	73.4	36.7	36.7	32.7	40.7	8.0	5.7	32.0	0.05	7.8	28.9	44.5
MROC	C-141	2	284.7	142.4	142.4	48.5	236.2	187.7	132.7	17615.6	0.05	183.9	-41.6	326.3
MROC	C-17	2	71.8	35.9	35.9	23.3	48.5	25.2	17.8	317.5	0.05	24.7	11.2	60.6
MSLP	C-130	1	199.0	199.0	199.0	199.0	199.0	0.0						
MSLP	C-17	1	74.0	74.0	74.0	74.0	74.0	0.0						
MSSS	C-130	1	1.0	1.0	1.0	1.0	1.0	0.0						
MUGM	C-130	10	696.2	69.6	69.3	6.5	192.5	186.0	58.6	3430.2	0.05	36.3	33.3	105.9
MUGM	C-141	7	344.0	49.1	44.5	23.0	96.0	73.0	25.7	660.1	0.05	19.0	30.1	68.2
MUGM	C-17	1	3.6	3.6	3.6	3.6	3.6	0.0						
MWCR	C-130	6	450.8	75.1	70.8	18.0	126.6	108.6	45.1	2037.4	0.05	36.1	39.0	111.2
MWCR	C-141	1	94.3	94.3	94.3	94.3	94.3	0.0						
MWCR	C-5	1	23.7	23.7	23.7	23.7	23.7	0.0						
MYNN	C-130	2	188.3	94.2	94.2	91.5	96.8	5.3	3.7	14.0	0.05	5.2	89.0	99.3
MYNN	C-141	1	56.0	56.0	56.0	56.0	56.0	0.0						
MZBZ	C-130	1	57.0	57.0	57.0	57.0	57.0	0.0						
NSTU	C-141	8	757.5	94.7	63.5	4.0	322.6	318.6	101.3	10271.3	0.05	70.2	24.5	164.9
NSTU	C-17	3	343.1	114.4	141.5	40.2	161.4	121.2	65.0	4224.5	0.05	73.5	40.8	187.9
NSTU	C-5	3	199.1	66.4	89.5	19.8	89.8	70.0	40.3	1626.4	0.05	45.6	20.7	112.0
NSTU	KC-10	1	95.0	95.0	95.0	95.0	95.0	0.0						
NTAA	KC-135	1	30.7	30.7	30.7	30.7	30.7	0.0						
NZCH	C-141	66	4751.2	72.0	61.1	0.5	226.0	225.5	54.3	2950.0	0.05	13.1	58.9	85.1
NZCH	C-17	8	466.0	58.3	47.7	0.3	163.3	163.0	47.2	2230.9	0.05	32.7	25.5	91.0
NZCH	C-5	4	192.2	48.1	51.1	24.5	65.5	41.0	17.3	300.3	0.05	17.0	31.1	65.0
NZIR	C-17	1	57.5	57.5	57.5	57.5	57.5	0.0						
OAIX	C-17	14	607.0	43.4	29.0	0.8	127.5	126.7	41.7	1736.3	0.05	21.8	21.5	65.2
OAKB	C-17	1	0.5	0.5	0.5	0.5	0.5	0.0						
OAKN	C-141	1	45.0	45.0	45.0	45.0	45.0	0.0						

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OAKN	C-17	10	275.3	27.5	21.9	1.5	64.8	63.3	21.9	481.0	0.05	13.6	13.9	41.1
OBBI	C-130	1	83.2	83.2	83.2	83.2	83.2	0.0						
OBBI	C-141	24	1596.4	66.5	48.9	4.0	237.5	233.5	58.9	3468.3	0.05	23.6	43.0	90.1
OBBI	C-17	5	316.5	63.3	63.7	34.0	87.0	53.0	20.6	425.7	0.05	18.1	45.2	81.4
OBBI	C-5	20	1263.4	63.2	42.3	9.0	315.0	306.0	69.1	4776.7	0.05	30.3	32.9	93.5
OBBI	KC-10	2	86.5	43.3	43.3	20.5	66.0	45.5	32.2	1035.1	0.05	44.6	-1.3	87.8
OBBI	KC-135	1	52.0	52.0	52.0	52.0	52.0	0.0						
OBBS	C-141	1	100.8	100.8	100.8	100.8	100.8	0.0						
OBBS	C-17	6	451.8	75.3	69.9	19.8	140.4	120.6	46.0	2113.5	0.05	36.8	38.5	112.1
OBBS	KC-135	1	300.0	300.0	300.0	300.0	300.0	0.0						
OEJN	C-17	1	0.5	0.5	0.5	0.5	0.5	0.0						
OEPS	C-130	1	35.0	35.0	35.0	35.0	35.0	0.0						
OEPS	C-141	5	201.7	40.3	26.0	18.5	73.2	54.7	24.2	586.5	0.05	21.2	19.1	61.6
OEPS	C-17	13	596.2	45.9	45.4	1.0	144.0	143.0	39.6	1571.9	0.05	21.6	24.3	67.4
OEPS	C-5	17	739.9	43.5	21.3	2.0	205.0	203.0	57.4	3291.9	0.05	27.3	16.2	70.8
OEPS	KC-10	1	9.0	9.0	9.0	9.0	9.0	0.0						
OEPS	KC-135	5	243.2	48.6	56.5	7.7	71.0	63.3	24.0	578.3	0.05	21.1	27.6	69.7
OERR	C-5	1	70.5	70.5	70.5	70.5	70.5	0.0						
OETB	C-17	2	94.0	47.0	47.0	46.6	47.4	0.8	0.6	0.3	0.05	0.8	46.2	47.8
OJ1X	C-130	2	181.3	90.7	90.7	63.8	117.5	53.7	38.0	1441.8	0.05	52.6	38.0	143.3
OJ1X	C-17	2	136.9	68.5	68.5	13.3	123.6	110.3	78.0	6083.0	0.05	108.1	-39.6	176.5
OJ1X	C-5	3	99.4	33.1	41.5	3.0	54.9	51.9	26.9	725.9	0.05	30.5	2.6	63.6
OJ2X	C-5	1	46.5	46.5	46.5	46.5	46.5	0.0						
OJAF	C-5	1	71.0	71.0	71.0	71.0	71.0	0.0						
OJAM	C-141	1	15.3	15.3	15.3	15.3	15.3	0.0						
OJAM	C-17	2	133.5	66.8	66.8	38.7	94.8	56.1	39.7	1573.6	0.05	55.0	11.8	121.7
OJAM	C-5	1	28.5	28.5	28.5	28.5	28.5	0.0						
OJHF	C-17	1	15.0	15.0	15.0	15.0	15.0	0.0						
OKAS	C-130	3	495.1	165.0	240.3	10.5	244.3	233.8	133.8	17914.4	0.05	151.5	13.6	316.5
OKAS	C-17	3	122.4	40.8	43.4	11.5	67.5	56.0	28.1	789.1	0.05	31.8	9.0	72.6
OKBK	C-130	1	41.2	41.2	41.2	41.2	41.2	0.0						
OKBK	C-141	6	158.1	26.4	20.2	2.0	53.5	51.5	20.2	408.8	0.05	16.2	10.2	42.5

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OKBK	C-17	21	860.1	41.0	21.0	1.3	148.3	147.0	44.0	1935.3	0.05	18.8	22.1	59.8
OKBK	C-5	141	6435.9	45.6	27.5	0.3	310.0	309.7	53.5	2858.6	0.05	8.8	36.8	54.5
OKBK	KC-10	1	0.5	0.5	0.5	0.5	0.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
OMAM	C-5	2	172.0	86.0	86.0	40.0	132.0	92.0	65.1	4232.0	0.05	90.2	-4.2	176.2
OMAM	KC-10	98	7883.9	80.5	58.5	1.0	314.0	313.0	68.4	4681.3	0.05	13.5	66.9	94.0
OMAM	KC-135	2	32.7	16.4	16.4	2.5	30.2	27.7	19.6	383.6	0.05	27.1	-10.8	43.5
OMDB	C-17	1	50.4	50.4	50.4	50.4	50.4	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
OMFJ	C-130	2	119.0	59.5	59.5	27.0	92.0	65.0	46.0	2112.5	0.05	63.7	-4.2	123.2
OMFJ	C-17	2	95.7	47.9	47.9	45.0	50.7	5.7	4.0	16.2	0.05	5.6	42.3	53.4
OMFJ	KC-10	5	259.7	51.9	32.4	25.1	127.5	102.4	42.9	1836.3	0.05	37.6	14.4	89.5
OOMS	C-130	2	125.5	62.8	62.8	14.5	111.0	96.5	68.2	4656.1	0.05	94.6	-31.8	157.3
OOMS	C-141	1	185.7	185.7	185.7	185.7	185.7	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
OOMS	C-17	4	338.8	84.7	73.4	12.1	180.0	167.9	70.1	4909.2	0.05	68.7	16.0	153.4
OOMS	C-5	3	187.8	62.6	67.8	28.2	91.8	63.6	32.1	1031.5	0.05	36.3	26.3	98.9
OOTH	C-17	2	194.3	97.2	97.2	67.5	126.8	59.3	41.9	1758.2	0.05	58.1	39.0	155.3
OOTH	C-5	1	44.5	44.5	44.5	44.5	44.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
OOTH	KC-10	1	385.1	385.1	385.1	385.1	385.1	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
OOTH	KC-135	1	123.5	123.5	123.5	123.5	123.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
OPJA	C-17	1	30.4	30.4	30.4	30.4	30.4	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
OPRN	C-17	1	54.0	54.0	54.0	54.0	54.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
ORA3	C-5	2	170.2	85.1	85.1	45.8	124.4	78.6	55.6	3089.0	0.05	77.0	8.1	162.1
ORAA	C-17	1	22.5	22.5	22.5	22.5	22.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
ORBD	C-141	1	14.5	14.5	14.5	14.5	14.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
ORBD	C-5	13	273.4	21.0	7.5	0.5	92.0	91.5	28.7	825.4	0.05	15.6	5.4	36.6
ORBI	C-130	1	11.0	11.0	11.0	11.0	11.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
ORBI	C-17	6	161.7	27.0	11.2	0.1	90.5	90.4	35.9	1292.3	0.05	28.8	-1.8	55.7
ORBI	C-5	6	133.4	22.2	22.1	7.0	34.5	27.5	11.6	135.3	0.05	9.3	12.9	31.5
OTBD	C-17	87	6184.7	71.1	53.9	0.5	322.5	322.0	62.0	3846.5	0.05	13.0	58.1	84.1
OTBD	C-5	6	139.4	23.2	26.4	5.3	33.3	28.0	11.2	126.1	0.05	9.0	14.2	32.2
OTBH	C-141	1	45.3	45.3	45.3	45.3	45.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
OTBH	C-17	139	4521.5	32.5	20.5	0.5	243.8	243.3	36.8	1357.7	0.05	6.1	26.4	38.7
OTBH	C-5	15	853.2	56.9	41.0	0.8	273.0	272.2	63.6	4043.0	0.05	32.2	24.7	89.1

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OTBH	KC-10	59	5360.4	90.9	62.7	0.5	390.0	389.5	86.8	7525.9	0.05	22.1	68.7	113.0
OTBH	KC-135	1	7.2	7.2	7.2	7.2	7.2	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
PABI	C-130	1	27.5	27.5	27.5	27.5	27.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
PADQ	C-17	1	75.0	75.0	75.0	75.0	75.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
PADQ	C-5	1	48.3	48.3	48.3	48.3	48.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
PAED	C-130	4	193.8	48.5	53.2	32.8	54.7	21.9	10.5	109.7	0.05	10.3	38.2	58.7
PAED	C-141	65	2192.0	33.7	20.5	0.8	365.5	364.7	51.4	2639.8	0.05	12.5	21.2	46.2
PAED	C-17	47	1054.1	22.4	8.0	0.6	177.0	176.4	32.7	1070.0	0.05	9.4	13.1	31.8
PAED	C-5	184	6649.3	36.1	21.0	0.4	304.0	303.6	47.0	2204.7	0.05	6.8	29.4	42.9
PAED	KC-10	27	822.3	30.5	22.8	0.1	141.2	141.1	28.5	813.4	0.05	10.8	19.7	41.2
PAED	KC-135	36	1462.7	40.6	30.6	0.8	120.0	119.2	29.8	888.7	0.05	9.7	30.9	50.4
PAEI	C-141	2	86.6	43.3	43.3	15.9	70.7	54.8	38.7	1501.5	0.05	53.7	-10.4	97.0
PAEI	C-17	4	242.9	60.7	37.5	20.5	147.5	127.0	58.4	3412.5	0.05	57.2	3.5	118.0
PAEI	C-5	7	184.4	26.3	19.0	13.0	71.3	58.3	20.4	416.9	0.05	15.1	11.2	41.5
PAEI	KC-10	19	636.7	33.5	28.5	4.6	76.0	71.4	18.8	353.6	0.05	8.5	25.1	42.0
PAEI	KC-135	11	659.0	59.9	26.0	1.2	338.9	337.7	99.6	9917.3	0.05	58.9	1.1	118.8
PAFB	C-5	2	132.3	66.2	66.2	42.3	90.0	47.7	33.7	1137.6	0.05	46.7	19.4	112.9
PAJN	C-5	1	93.5	93.5	93.5	93.5	93.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
PANC	C-130	1	23.5	23.5	23.5	23.5	23.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
PANC	C-141	1	5.2	5.2	5.2	5.2	5.2	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
PANC	C-5	1	13.8	13.8	13.8	13.8	13.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
PGSN	C-141	1	22.5	22.5	22.5	22.5	22.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
PGUA	C-130	2	190.0	95.0	95.0	45.5	144.5	99.0	70.0	4900.5	0.05	97.0	-2.0	192.0
PGUA	C-141	36	1727.9	48.0	35.6	0.4	172.4	172.0	42.7	1819.2	0.05	13.9	34.1	61.9
PGUA	C-17	44	1982.3	45.1	39.2	0.6	133.5	132.9	36.2	1307.9	0.05	10.7	34.4	55.7
PGUA	C-5	384	17343.4	45.2	23.9	0.2	351.0	350.8	56.5	3190.5	0.05	5.6	39.5	50.8
PGUA	KC-10	48	2441.9	50.9	34.2	0.2	197.2	197.0	45.4	2064.0	0.05	12.9	38.0	63.7
PGUA	KC-135	59	3446.6	58.4	44.7	0.5	218.5	218.0	51.2	2618.6	0.05	13.1	45.4	71.5
PGUM	C-17	1	28.2	28.2	28.2	28.2	28.2	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
PGUM	KC-10	1	15.0	15.0	15.0	15.0	15.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
PHBK	C-17	3	67.0	22.3	30.5	5.0	31.5	26.5	15.0	225.6	0.05	17.0	5.3	39.3
PHBK	C-5	2	52.3	26.2	26.2	5.3	47.0	41.7	29.5	869.4	0.05	40.9	-14.7	67.0

Location (ICAO)	Fleet (MDS)	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
PHIK	C-130	37	1997.8	54.0	46.7	0.3	243.3	243.0	47.0	2211.8	0.05	15.2	38.8	69.1
PHIK	C-141	274	7737.9	28.2	20.2	0.3	244.0	243.7	31.4	984.1	0.05	3.7	24.5	32.0
PHIK	C-17	105	3305.8	31.5	24.5	0.3	189.0	188.7	32.2	1039.3	0.05	6.2	25.3	37.6
PHIK	C-5	438	12183.8	27.8	18.3	0.1	358.8	358.7	36.6	1339.9	0.05	3.4	24.4	31.2
PHIK	KC-10	132	3721.5	28.2	23.0	0.3	188.3	188.0	24.2	585.0	0.05	4.1	24.1	32.3
PHIK	KC-135	159	6804.4	42.8	30.5	0.1	377.6	377.5	46.1	2129.0	0.05	7.2	35.6	50.0
PHKO	C-130	1	53.2	53.2	53.2	53.2	53.2	0.0	[redacted]					
PHKO	C-141	1	26.2	26.2	26.2	26.2	26.2	0.0	[redacted]					
PHNG	C-141	2	6.0	3.0	3.0	2.5	3.5	1.0	0.7	0.5	0.05	1.0	2.0	4.0
PHNG	C-17	1	21.9	21.9	21.9	21.9	21.9	0.0	[redacted]					
PHNG	C-5	16	241.5	15.1	9.2	0.5	46.8	46.3	13.8	189.5	0.05	6.7	8.3	21.8
PHOG	C-5	1	15.0	15.0	15.0	15.0	15.0	0.0	[redacted]					
PHTO	C-5	2	45.9	23.0	23.0	17.7	28.2	10.5	7.4	55.1	0.05	10.3	12.7	33.2
PJON	C-141	1	2.8	2.8	2.8	2.8	2.8	0.0	[redacted]					
PKWA	C-130	3	239.5	79.8	85.0	67.0	87.5	20.5	11.2	125.1	0.05	12.7	67.2	92.5
PKWA	C-141	2	80.8	40.4	40.4	25.8	55.0	29.2	20.6	426.3	0.05	28.6	11.8	69.0
PKWA	C-5	3	120.3	40.1	51.0	2.8	66.5	63.7	33.2	1103.5	0.05	37.6	2.5	77.7
PMDY	KC-135	1	76.8	76.8	76.8	76.8	76.8	0.0	[redacted]					
PWAK	C-130	1	263.5	263.5	263.5	263.5	263.5	0.0	[redacted]					
PWAK	C-141	5	197.0	39.4	25.5	22.0	78.2	56.2	23.8	566.2	0.05	20.9	18.5	60.3
PWAK	C-5	4	175.9	44.0	42.7	21.0	69.5	48.5	19.9	395.2	0.05	19.5	24.5	63.5
PWAK	KC-10	1	39.0	39.0	39.0	39.0	39.0	0.0	[redacted]					
PWAK	KC-135	3	92.3	30.8	24.8	21.0	46.5	25.5	13.8	189.3	0.05	15.6	15.2	46.3
RJOI	C-141	1	70.3	70.3	70.3	70.3	70.3	0.0	[redacted]					
RJOI	C-17	2	82.5	41.3	41.3	35.0	47.5	12.5	8.8	78.1	0.05	12.2	29.0	53.5
RJOI	C-5	3	266.7	88.9	93.0	55.2	118.5	63.3	31.8	1014.3	0.05	36.0	52.9	124.9
RJOI	KC-10	5	183.3	36.7	41.0	26.0	47.3	21.3	9.4	88.3	0.05	8.2	28.4	44.9
RJSM	C-141	5	250.2	50.0	37.0	4.7	127.3	122.6	46.5	2166.5	0.05	40.8	9.2	90.8
RJSM	C-17	1	16.5	16.5	16.5	16.5	16.5	0.0	[redacted]					
RJSM	C-5	9	335.4	37.3	24.5	18.5	74.5	56.0	22.9	525.9	0.05	15.0	22.3	52.3
RJSM	KC-10	10	222.4	22.2	17.4	1.3	74.5	73.2	20.5	422.1	0.05	12.7	9.5	35.0
RJSM	KC-135	6	252.2	42.0	40.6	19.8	71.5	51.7	21.0	442.8	0.05	16.8	25.2	58.9

Location (ICAO)	Fleet (MDS)	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
RJTA	C-141	1	58.0	58.0	58.0	58.0	58.0	0.0	[redacted]					
RJTA	C-17	1	8.5	8.5	8.5	8.5	8.5	0.0	[redacted]					
RJTA	KC-135	1	14.0	14.0	14.0	14.0	14.0	0.0	[redacted]					
RJTY	C-130	4	186.0	46.5	36.4	21.0	92.2	71.2	32.0	1024.7	0.05	31.4	15.1	77.9
RJTY	C-141	30	1246.8	41.6	31.2	0.3	226.5	226.2	45.5	2074.2	0.05	16.3	25.3	57.9
RJTY	C-17	116	4007.6	34.6	16.8	0.3	191.7	191.4	41.4	1713.7	0.05	7.5	27.0	42.1
RJTY	C-5	167	5824.3	34.9	17.5	0.5	330.5	330.0	44.5	1976.3	0.05	6.7	28.1	41.6
RJTY	KC-10	55	2002.7	36.4	27.5	0.2	213.0	212.8	37.6	1415.7	0.05	9.9	26.5	46.4
RJTY	KC-135	23	1329.5	57.8	55.2	3.8	130.5	126.7	37.3	1393.8	0.05	15.3	42.5	73.1
RKJK	C-141	1	21.5	21.5	21.5	21.5	21.5	0.0	[redacted]					
RKJK	C-5	1	13.0	13.0	13.0	13.0	13.0	0.0	[redacted]					
RKPK	KC-10	2	275.8	137.9	137.9	45.3	230.5	185.2	131.0	17149.5	0.05	181.5	-43.6	319.4
RKSM	C-5	1	19.8	19.8	19.8	19.8	19.8	0.0	[redacted]					
RKSO	C-141	4	340.5	85.1	78.6	37.1	146.2	109.1	53.8	2890.2	0.05	52.7	32.4	137.8
RKSO	C-17	9	349.6	38.8	24.8	5.5	111.7	106.2	37.3	1394.5	0.05	24.4	14.4	63.2
RKSO	C-5	44	1936.7	44.0	31.9	2.0	150.5	148.5	36.0	1296.2	0.05	10.6	33.4	54.7
RKSO	KC-10	7	268.2	38.3	45.1	11.2	58.5	47.3	18.8	351.9	0.05	13.9	24.4	52.2
RKSO	KC-135	2	123.3	61.7	61.7	59.5	63.8	4.3	3.0	9.2	0.05	4.2	57.4	65.9
RKTH	C-141	1	25.0	25.0	25.0	25.0	25.0	0.0	[redacted]					
RKTN	C-141	1	78.5	78.5	78.5	78.5	78.5	0.0	[redacted]					
RODN	C-130	5	73.6	14.7	12.4	3.7	33.4	29.7	11.1	122.9	0.05	9.7	5.0	24.4
RODN	C-141	49	1905.7	38.9	22.8	0.5	285.0	284.5	54.6	2982.7	0.05	15.3	23.6	54.2
RODN	C-17	62	1974.2	31.8	21.8	0.3	144.0	143.7	31.4	988.5	0.05	7.8	24.0	39.7
RODN	C-5	190	7619.5	40.1	24.2	0.1	301.3	301.2	46.3	2144.9	0.05	6.6	33.5	46.7
RODN	KC-10	28	1879.9	67.1	45.1	0.8	303.3	302.5	72.3	5226.9	0.05	26.8	40.4	93.9
RODN	KC-135	27	1471.3	54.5	43.5	4.5	192.5	188.0	50.0	2504.6	0.05	18.9	35.6	73.4
ROTM	C-5	1	6.7	6.7	6.7	6.7	6.7	0.0	[redacted]					
RPLC	C-5	3	211.5	70.5	73.5	44.5	93.5	49.0	24.6	607.0	0.05	27.9	42.6	98.4
RPLL	C-141	1	407.5	407.5	407.5	407.5	407.5	0.0	[redacted]					
RPLL	KC-135	1	28.8	28.8	28.8	28.8	28.8	0.0	[redacted]					
RPMZ	C-17	1	261.6	261.6	261.6	261.6	261.6	0.0	[redacted]					
SAEZ	C-141	2	316.6	158.3	158.3	98.6	218.0	119.4	84.4	7128.2	0.05	117.0	41.3	275.3

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SAEZ	C-17	1	82.1	82.1	82.1	82.1	82.1	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SAEZ	C-5	1	20.5	20.5	20.5	20.5	20.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SAME	C-5	1	67.2	67.2	67.2	67.2	67.2	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SBBR	C-141	1	21.8	21.8	21.8	21.8	21.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SBBR	C-5	1	2.5	2.5	2.5	2.5	2.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SBEG	C-130	3	324.5	108.2	95.3	89.0	140.2	51.2	27.9	779.5	0.05	31.6	76.6	139.8
SBGL	C-141	3	470.6	156.9	158.1	149.0	163.5	14.5	7.3	53.7	0.05	8.3	148.6	165.2
SBGL	KC-135	1	57.0	57.0	57.0	57.0	57.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SCDA	KC-135	1	95.3	95.3	95.3	95.3	95.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SCEL	C-130	1	63.0	63.0	63.0	63.0	63.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SCEL	C-141	3	205.8	68.6	67.0	61.3	77.5	16.2	8.2	67.5	0.05	9.3	59.3	77.9
SCEL	C-17	1	47.3	47.3	47.3	47.3	47.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SCEL	C-5	2	134.0	67.0	67.0	55.3	78.7	23.4	16.5	273.8	0.05	22.9	44.1	89.9
SCEL	KC-10	1	18.5	18.5	18.5	18.5	18.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SCEL	KC-135	1	111.3	111.3	111.3	111.3	111.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SCFA	C-5	1	115.5	115.5	115.5	115.5	115.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SEGU	C-141	5	374.2	74.8	70.5	43.7	107.5	63.8	25.2	634.1	0.05	22.1	52.8	96.9
SEGU	C-17	2	140.7	70.4	70.4	38.4	102.3	63.9	45.2	2041.6	0.05	62.6	7.7	133.0
SEMT	C-130	1	149.5	149.5	149.5	149.5	149.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SEMT	C-5	1	29.0	29.0	29.0	29.0	29.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SEQU	C-141	2	138.0	69.0	69.0	64.0	74.0	10.0	7.1	50.0	0.05	9.8	59.2	78.8
SEQU	C-17	1	17.5	17.5	17.5	17.5	17.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SEQU	KC-135	1	63.5	63.5	63.5	63.5	63.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SGAS	C-130	1	0.6	0.6	0.6	0.6	0.6	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SKBO	C-130	4	217.9	54.5	54.0	14.4	95.5	81.1	45.7	2084.7	0.05	44.7	9.7	99.2
SKBO	C-141	3	404.1	134.7	120.6	24.4	259.1	234.7	118.0	13920.1	0.05	133.5	1.2	268.2
SKBQ	C-130	1	74.5	74.5	74.5	74.5	74.5	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SKCG	C-130	4	421.8	105.5	48.0	15.5	310.3	294.8	137.4	18889.3	0.05	134.7	-29.2	240.1
SKCG	C-141	1	81.3	81.3	81.3	81.3	81.3	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SKCG	C-5	1	119.0	119.0	119.0	119.0	119.0	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SKCL	C-17	1	27.8	27.8	27.8	27.8	27.8	0.0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
SLLP	C-141	2	131.5	65.8	65.8	27.5	104.0	76.5	54.1	2926.1	0.05	75.0	-9.2	140.7

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SLVR	C-141	3	195.0	65.0	60.0	41.0	94.0	53.0	26.9	721.0	0.05	30.4	34.6	95.4
SPIM	C-130	2	149.3	74.7	74.7	49.0	100.3	51.3	36.3	1315.8	0.05	50.3	24.4	124.9
SPIM	C-141	1	18.3	18.3	18.3	18.3	18.3	0.0	[redacted]					
SPIM	C-17	2	126.3	63.2	63.2	47.5	78.8	31.3	22.1	489.8	0.05	30.7	32.5	93.8
SPIM	C-5	4	264.3	66.1	59.8	2.3	142.5	140.2	57.7	3330.4	0.05	56.6	9.5	122.6
SPIM	KC-135	1	31.2	31.2	31.2	31.2	31.2	0.0	[redacted]					
SUMU	C-141	1	147.7	147.7	147.7	147.7	147.7	0.0	[redacted]					
SUMU	C-5	1	45.5	45.5	45.5	45.5	45.5	0.0	[redacted]					
SVMI	C-130	1	94.0	94.0	94.0	94.0	94.0	0.0	[redacted]					
TAPA	C-130	2	42.5	21.3	21.3	8.5	34.0	25.5	18.0	325.1	0.05	25.0	-3.7	46.2
TAPA	C-5	1	20.0	20.0	20.0	20.0	20.0	0.0	[redacted]					
TBPB	C-130	1	22.5	22.5	22.5	22.5	22.5	0.0	[redacted]					
TBPB	C-17	1	30.5	30.5	30.5	30.5	30.5	0.0	[redacted]					
TIST	C-130	3	115.8	38.6	28.8	13.5	73.5	60.0	31.2	972.0	0.05	35.3	3.3	73.9
TISX	C-130	13	988.5	76.0	69.5	19.8	212.8	193.0	59.3	3517.4	0.05	32.2	43.8	108.3
TISX	C-141	24	1471.1	61.3	47.5	22.3	249.4	227.1	47.8	2283.7	0.05	19.1	42.2	80.4
TISX	C-17	8	306.7	38.3	23.8	5.5	122.5	117.0	37.0	1367.6	0.05	25.6	12.7	64.0
TISX	C-5	2	119.3	59.7	59.7	27.0	92.3	65.3	46.2	2132.0	0.05	64.0	-4.3	123.6
TISX	KC-10	2	49.8	24.9	24.9	22.8	27.0	4.2	3.0	8.8	0.05	4.1	20.8	29.0
TJBQ	C-130	3	44.6	14.9	13.5	8.8	22.3	13.5	6.9	47.0	0.05	7.8	7.1	22.6
TJBQ	C-141	1	23.5	23.5	23.5	23.5	23.5	0.0	[redacted]					
TJBQ	C-5	1	146.1	146.1	146.1	146.1	146.1	0.0	[redacted]					
TJNR	C-130	60	3560.9	59.4	37.9	2.3	422.8	420.5	63.1	3984.8	0.05	16.0	43.4	75.3
TJNR	C-141	42	1946.3	46.3	34.2	1.0	217.1	216.1	40.2	1612.2	0.05	12.1	34.2	58.5
TJNR	C-17	5	158.6	31.7	32.5	15.0	45.0	30.0	13.3	176.1	0.05	11.6	20.1	43.4
TJNR	C-5	18	994.9	55.3	40.9	1.1	158.4	157.3	41.9	1755.3	0.05	19.4	35.9	74.6
TJNR	KC-135	10	399.5	40.0	47.0	2.5	73.0	70.5	26.0	676.6	0.05	16.1	23.8	56.1
TJPS	C-130	3	226.1	75.4	93.8	31.8	100.5	68.7	37.9	1434.8	0.05	42.9	32.5	118.2
TJPS	C-141	2	120.3	60.2	60.2	29.8	90.5	60.7	42.9	1842.2	0.05	59.5	0.7	119.6
TJPS	C-17	1	29.2	29.2	29.2	29.2	29.2	0.0	[redacted]					
TJPS	C-5	2	54.7	27.4	27.4	12.2	42.5	30.3	21.4	459.0	0.05	29.7	-2.3	57.0
TJSJ	C-130	53	2153.4	40.6	28.5	2.0	142.5	140.5	37.8	1429.2	0.05	10.2	30.5	50.8

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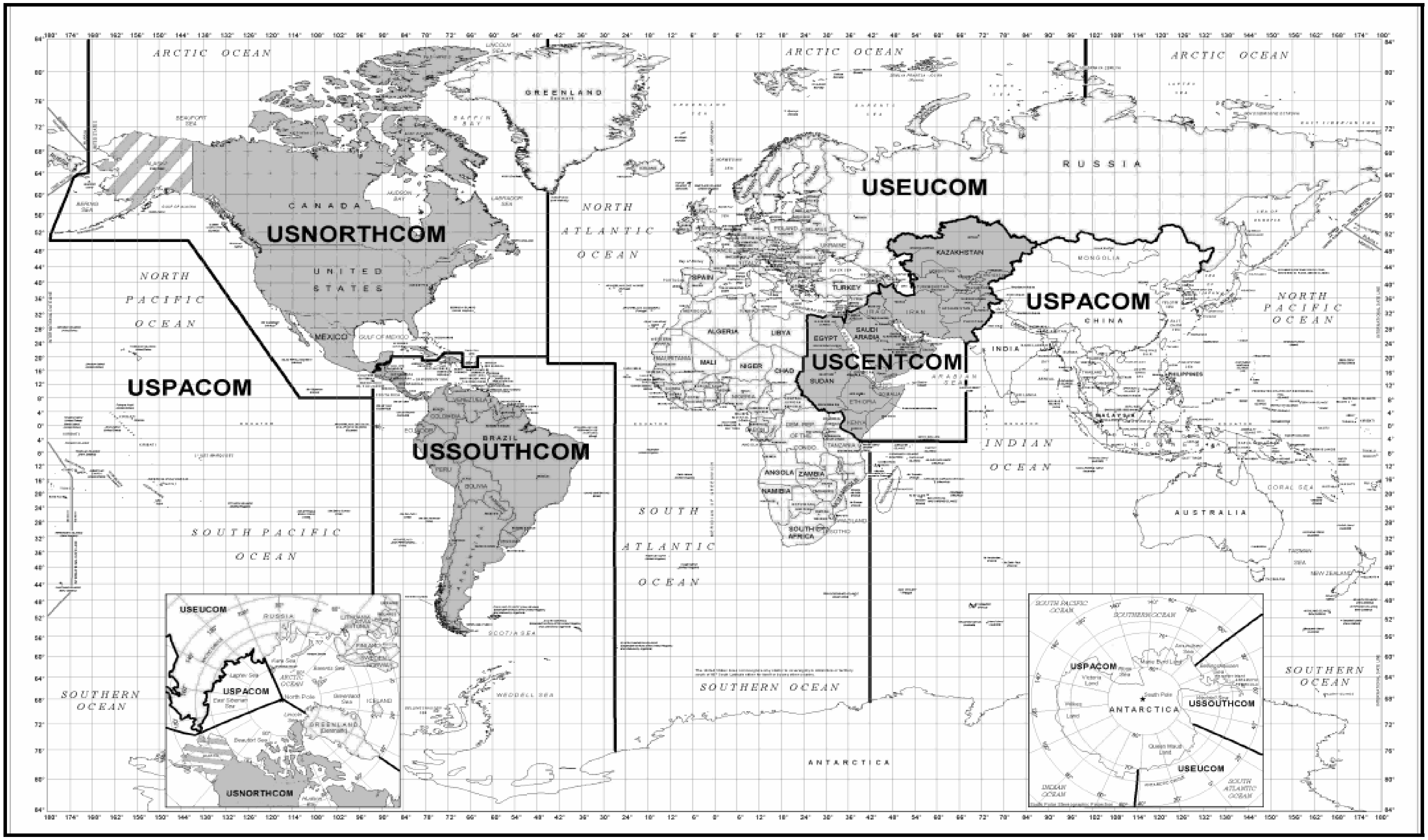
TJSJ	C-141	1	69.6	69.6	69.6	69.6	69.6	0.0						
TJSJ	C-17	1	23.0	23.0	23.0	23.0	23.0	0.0						
TJSJ	KC-135	2	125.6	62.8	62.8	61.6	64.0	2.4	1.7	2.9	0.05	2.4	60.4	65.2
TNCC	C-130	2	128.7	64.4	64.4	46.5	82.2	35.7	25.2	637.2	0.05	35.0	29.4	99.3
TNCC	C-141	2	74.8	37.4	37.4	29.5	45.3	15.8	11.2	124.8	0.05	15.5	21.9	52.9
TNCC	KC-135	4	320.7	80.2	83.8	28.4	124.8	96.4	49.9	2485.9	0.05	48.9	31.3	129.0
TTPP	C-5	1	92.0	92.0	92.0	92.0	92.0	0.0						
UAFM	C-17	6	203.8	34.0	38.0	12.0	46.6	34.6	13.2	174.0	0.05	10.6	23.4	44.5
UAFM	C-5	5	443.1	88.6	75.0	47.5	139.3	91.8	42.7	1822.0	0.05	37.4	51.2	126.0
UAFM	KC-135	1	79.8	79.8	79.8	79.8	79.8	0.0						
UTAA	C-17	13	758.1	58.3	36.0	5.3	283.0	277.7	74.7	5577.3	0.05	40.6	17.7	98.9
UTDD	C-17	6	122.1	20.4	20.8	1.8	36.5	34.7	12.1	145.7	0.05	9.7	10.7	30.0
UTSK	C-130	2	82.6	41.3	41.3	1.4	81.2	79.8	56.4	3184.0	0.05	78.2	-36.9	119.5
UTSK	C-17	12	393.4	32.8	31.9	8.3	56.6	48.3	14.8	219.6	0.05	8.4	24.4	41.2
UTSL	C-17	3	65.4	21.8	32.0	0.4	33.0	32.6	18.5	343.7	0.05	21.0	0.8	42.8
UTTT	C-141	1	126.5	126.5	126.5	126.5	126.5	0.0						
VIDP	C-17	1	0.3	0.3	0.3	0.3	0.3	0.0						
VIDP	C-5	1	16.2	16.2	16.2	16.2	16.2	0.0						
VIDP	KC-10	1	131.5	131.5	131.5	131.5	131.5	0.0						
VRMM	KC-135	1	73.0	73.0	73.0	73.0	73.0	0.0						
VTBD	C-141	2	230.3	115.2	115.2	111.3	119.0	7.7	5.4	29.6	0.05	7.5	107.6	122.7
VTBD	C-17	2	103.7	51.9	51.9	49.2	54.5	5.3	3.7	14.0	0.05	5.2	46.7	57.0
VTBD	C-5	2	80.2	40.1	40.1	23.7	56.5	32.8	23.2	537.9	0.05	32.1	8.0	72.2
VTBD	KC-10	2	41.0	20.5	20.5	2.0	39.0	37.0	26.2	684.5	0.05	36.3	-15.8	56.8
VTBU	C-141	1	33.8	33.8	33.8	33.8	33.8	0.0						
VTBU	C-17	15	1106.0	73.7	52.8	20.5	208.0	187.5	51.2	2620.9	0.05	25.9	47.8	99.6
VTBU	C-5	45	2797.6	62.2	36.3	3.9	257.5	253.6	57.1	3265.8	0.05	16.7	45.5	78.9
VTBU	KC-10	3	202.3	67.4	73.8	20.5	108.0	87.5	44.1	1944.5	0.05	49.9	17.5	117.3
VTBU	KC-135	6	217.3	36.2	29.7	25.0	67.0	42.0	15.9	252.7	0.05	12.7	23.5	48.9
VTCC	C-17	1	81.3	81.3	81.3	81.3	81.3	0.0						
VTSS	C-5	1	84.5	84.5	84.5	84.5	84.5	0.0						
VTUN	C-5	1	38.0	38.0	38.0	38.0	38.0	0.0						

Location (ICAO)	Fleet (MDS)	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
VTUN	KC-10	3	116.2	38.7	45.3	0.2	70.7	70.5	35.7	1274.9	0.05	40.4	-1.7	79.1
VVDN	C-17	1	109.5	109.5	109.5	109.5	109.5	0.0						
VVTS	KC-10	1	37.0	37.0	37.0	37.0	37.0	0.0						
WIIH	C-141	1	48.4	48.4	48.4	48.4	48.4	0.0						
WSAP	C-141	7	962.2	137.5	114.0	48.0	266.3	218.3	78.5	6162.6	0.05	58.2	79.3	195.6
WSAP	C-17	18	1008.7	56.0	49.5	0.5	165.1	164.6	45.0	2028.6	0.05	20.8	35.2	76.8
WSAP	C-5	1	10.5	10.5	10.5	10.5	10.5	0.0						
WSAP	KC-10	34	1970.4	58.0	53.8	0.4	165.3	164.9	39.3	1544.9	0.05	13.2	44.7	71.2
WSAP	KC-135	2	70.5	35.3	35.3	2.0	68.5	66.5	47.0	2211.1	0.05	65.2	-29.9	100.4
WSSS	KC-10	4	212.7	53.2	57.5	29.7	68.0	38.3	17.7	312.1	0.05	17.3	35.9	70.5
WSSS	KC-135	2	86.5	43.3	43.3	33.0	53.5	20.5	14.5	210.1	0.05	20.1	23.2	63.3
YBBN	C-5	1	18.0	18.0	18.0	18.0	18.0	0.0						
YBBN	KC-10	1	21.0	21.0	21.0	21.0	21.0	0.0						
YBCS	C-141	1	66.0	66.0	66.0	66.0	66.0	0.0						
YBCS	C-17	3	81.8	27.3	22.8	19.5	39.5	20.0	10.7	115.0	0.05	12.1	15.1	39.4
YBRK	C-141	1	51.0	51.0	51.0	51.0	51.0	0.0						
YBTL	C-5	6	570.5	95.1	54.3	1.5	330.0	328.5	125.9	15840.5	0.05	100.7	-5.6	195.8
YPDN	C-17	1	85.5	85.5	85.5	85.5	85.5	0.0						
YPDN	C-5	5	235.3	47.1	45.5	19.3	66.5	47.2	18.5	342.3	0.05	16.2	30.8	63.3
YPDN	KC-10	2	119.5	59.8	59.8	57.5	62.0	4.5	3.2	10.1	0.05	4.4	55.3	64.2
YPDN	KC-135	7	677.0	96.7	96.3	4.7	215.0	210.3	73.1	5342.2	0.05	54.1	42.6	150.9
YPED	C-141	1	58.0	58.0	58.0	58.0	58.0	0.0						
YPPH	C-17	1	37.1	37.1	37.1	37.1	37.1	0.0						
YPPH	C-5	1	134.8	134.8	134.8	134.8	134.8	0.0						
YPTN	C-17	1	3.8	3.8	3.8	3.8	3.8	0.0						
YPTN	C-5	1	100.5	100.5	100.5	100.5	100.5	0.0						
YSRI	C-130	1	123.0	123.0	123.0	123.0	123.0	0.0						
YSRI	C-141	29	1699.5	58.6	45.8	0.5	196.1	195.6	51.9	2695.8	0.05	18.9	39.7	77.5
YSRI	C-17	11	392.5	35.7	30.2	12.5	65.3	52.8	17.4	301.0	0.05	10.3	25.4	45.9
YSRI	C-5	9	873.0	97.0	77.0	1.8	248.0	246.2	73.1	5342.1	0.05	47.8	49.2	144.8
YSRI	KC-10	7	396.8	56.7	63.0	2.5	95.5	93.0	34.2	1169.8	0.05	25.3	31.4	82.0
ZBAA	C-17	1	17.2	17.2	17.2	17.2	17.2	0.0						

Appendix E. Supplemental Data Analysis

Figure E-1. Unified Command Areas of Responsibility Map



Defenselink: Unified Command Plan, (Office of the Assistant Secretary of Defense (Public Affairs), 2004).

Table E1. Regional Comparison of AMC Logistic Supports (2000 - 2004)

Region	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
U.S. NORTHERN COMMAND	5904	188113.2	**31.9**	22.0	0.1	422.8	422.7	36.4	1321.8	0.05	0.9	30.9	32.8
U.S. SOUTHERN COMMAND	140	9986.9	**71.3**	62.2	0.6	310.3	309.7	52.3	2730.1	0.05	8.7	62.7	80.0
U.S. PACIFIC COMMAND	3652	156112.4	**42.7**	26.5	0.1	407.5	407.4	49.1	2411.8	0.05	1.6	41.2	44.3
U.S. EUROPEAN COMMAND	5543	207332.1	**37.4**	22.3	0.1	449.5	449.4	46.1	2128.3	0.05	1.2	36.2	38.6
U.S. CENTRAL COMMAND	862	48192.8	**55.9**	37.5	0.1	390.0	389.9	60.4	3649.7	0.05	4.0	51.9	59.9

Data derived from the *Global Decision Support System* (AMC, 2002b), *Microsoft® Excel 2002* (Microsoft® Corporation, 2001), and $JMP_{6.0}$®, *The Statistical Discovery Software* (SAS Institute, 2005).

Table E2. Overall MDS Comparison (2000- 2004)

Fleet (MDS)	CONUS / OCONUS	En Route Location	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
C-5	CONUS	**N**	1873	61135.7	32.6	21.4	0.1	413.8	413.7	46.2	2131.3	0.05	2.1	30.5	34.7
	OCONUS	**N**	349	18653.5	53.5	38.0	0.5	330.0	329.5	39.3	1545.5	0.05	4.1	49.3	57.6
		Y	4084	144929.6	35.5	20.4	0.1	443.5	443.4	45.9	2105.4	0.05	1.4	34.1	36.9
	Total		6306	224718.8	35.6	21.5	0.1	443.5	443.4	44.7	1996.5	0.05	1.1	34.5	36.7
C-17	CONUS	**N**	1873	61135.7	32.6	21.4	0.1	413.8	413.7	46.2	2131.3	0.05	2.1	30.5	34.7
	OCONUS	**N**	349	18653.5	53.5	38.0	0.5	330.0	329.5	39.3	1545.5	0.05	4.1	49.3	57.6
		Y	4084	144929.6	35.5	20.4	0.1	443.5	443.4	45.9	2105.4	0.05	1.4	34.1	36.9
	Total		6306	224718.8	35.6	21.5	0.1	443.5	443.4	44.7	1996.5	0.05	1.1	34.5	36.7
C-141	CONUS	**N**	1873	61135.7	32.6	21.4	0.1	413.8	413.7	46.2	2131.3	0.05	2.1	30.5	34.7
	OCONUS	**N**	349	18653.5	53.5	38.0	0.5	330.0	329.5	39.3	1545.5	0.05	4.1	49.3	57.6
		Y	4084	144929.6	35.5	20.4	0.1	443.5	443.4	45.9	2105.4	0.05	1.4	34.1	36.9
	Total		6306	224718.8	35.6	21.5	0.1	443.5	443.4	44.7	1996.5	0.05	1.1	34.5	36.7
C-130	CONUS	**N**	1873	61135.7	32.6	21.4	0.1	413.8	413.7	46.2	2131.3	0.05	2.1	30.5	34.7
	OCONUS	**N**	349	18653.5	53.5	38.0	0.5	330.0	329.5	39.3	1545.5	0.05	4.1	49.3	57.6
		Y	4084	144929.6	35.5	20.4	0.1	443.5	443.4	45.9	2105.4	0.05	1.4	34.1	36.9
	Total		6306	224718.8	35.6	21.5	0.1	443.5	443.4	44.7	1996.5	0.05	1.1	34.5	36.7
KC-10	CONUS	**N**	1873	61135.7	32.6	21.4	0.1	413.8	413.7	46.2	2131.3	0.05	2.1	30.5	34.7
	OCONUS	**N**	349	18653.5	53.5	38.0	0.5	330.0	329.5	39.3	1545.5	0.05	4.1	49.3	57.6
		Y	4084	144929.6	35.5	20.4	0.1	443.5	443.4	45.9	2105.4	0.05	1.4	34.1	36.9
	Total		6306	224718.8	35.6	21.5	0.1	443.5	443.4	44.7	1996.5	0.05	1.1	34.5	36.7
KC-135	CONUS	**N**	1873	61135.7	32.6	21.4	0.1	413.8	413.7	46.2	2131.3	0.05	2.1	30.5	34.7
	OCONUS	**N**	349	18653.5	53.5	38.0	0.5	330.0	329.5	39.3	1545.5	0.05	4.1	49.3	57.6
		Y	4084	144929.6	35.5	20.4	0.1	443.5	443.4	45.9	2105.4	0.05	1.4	34.1	36.9
	Total		6306	224718.8	35.6	21.5	0.1	443.5	443.4	44.7	1996.5	0.05	1.1	34.5	36.7
MDS TOTALS			16101	609737.4	37.9	23.8	0.1	449.5	449.4	45.0	2029.4	0.05	0.7	37.2	38.6

Data derived from the *Global Decision Support System* (AMC, 2002b), *Microsoft® Excel 2002* (Microsoft® Corporation, 2001), and JMP$_{6.0}$®, *The Statistical Discovery Software* (SAS Institute, 2005).

Table E3. Pacific En Route Versus European En Route Locations (2000 – 2004)														
Fleet (MDS)	Regional AMOG	Number of Supports (N)	Total NMC Hours	Mean (μ)	Median	Minimum NMC Hours	Maximum NMC Hours	NMC Hour Range	Standard Deviation (σ)	Variance (σ2)	Alpha (α)	Confidence Interval	Estimated Minimum NMC Hours	Estimated Maximum NMC Hours
C-5	**715**	1486	56098.6	37.8	21.5	0.1	358.8	358.7	47.3	2241.6	0.05	2.4	35.3	40.2
	721	2598	88831.0	34.2	19.7	0.1	443.5	443.4	44.9	2019.5	0.05	1.7	32.5	35.9
C-17	**715**	460	17124.1	37.2	25.7	0.3	232.7	232.4	39.0	1517.6	0.05	3.6	33.7	40.8
	721	1675	55519.4	33.1	20.0	0.1	332.3	332.2	41.2	1701.4	0.05	2.0	31.2	35.1
C-141	**715**	574	23183.5	40.4	27.4	0.3	365.5	365.2	46.2	2134.8	0.05	3.8	36.6	44.2
	721	635	21892.0	34.5	21.5	0.2	449.5	449.3	42.9	1843.5	0.05	3.3	31.1	37.8
C-130	**715**	53	2764.2	52.2	44.8	0.3	243.3	243.0	44.4	1970.3	0.05	12.0	40.2	64.1
	721	162	7995.6	49.4	31.4	0.1	287.5	287.4	50.0	2502.6	0.05	7.7	41.7	57.1
KC-10	**715**	431	20032.6	46.5	29.0	0.1	395.3	395.2	50.8	2578.8	0.05	4.8	41.7	51.3
	721	211	12083.7	57.3	42.3	0.5	390.0	389.5	59.6	3556.5	0.05	8.0	49.2	65.3
KC-135	**715**	410	22922.8	55.9	39.6	0.1	377.6	377.5	56.3	3169.4	0.05	5.4	50.5	61.4
	721	308	19426.8	63.1	47.2	0.3	385.3	385.0	62.7	3932.5	0.05	7.0	56.1	70.1
TOTALS		9003	347874.3	42.0	26.2	0.1	449.5	449.4	49.1	2407.4	0.05	1.0	41.0	43.0

Data derived from the *Global Decision Support System* (AMC, 2002b), *Microsoft® Excel 2002* (Microsoft® Corporation, 2001), and JMP$_{6.0}$®, *The Statistical Discovery Software* (SAS Institute, 2005).

References

Air Force Doctrine Center (AFDC). (1999a). Air Force Doctrine Document 2-6: *Air mobility operations.* Maxwell Air Force Base, AL: HQ AFDC/DR.

-----. (1999b). Air Force Doctrine Document 2-6.1: *Airlift operations.* Maxwell Air Force Base, AL: HQ AFDC/DR.

-----. (1999c). Air Force Doctrine Document 2-6.2: *Air refueling.* Maxwell Air Force Base, AL: HQ AFDC/DR.

-----. (1999d). Air Force Doctrine Document 2-6.3: *Air mobility support.* Maxwell Air Force Base, AL: HQ AFDC/DR.

-----. (2000). Air Force Doctrine Document 2: *Organization and employment of aerospace power.* Maxwell Air Force Base, AL: HQ AFDC/DR.

-----. (2003). Air Force Doctrine Document 1: *Air Force basic doctrine.* Maxwell Air Force Base, AL: HQ AFDC/DR. Retrieved September 10, 2006, from http://www.e-publishing.af.mil/pubfiles/af/dd/afdd1/afdd1.pdf

-----. (2005). Air Force Doctrine Document 2-4: *Combat support.* Maxwell Air Force Base, AL: HQ AFDC/DR. Retrieved September 17, 2006, from http://www.e-publishing.af.mil/pubfiles/af/dd/afdd2-4/afdd2-4.pdf

Air Mobility Command (AMC). (1997). Air Mobility Command Instruction 23-102. *Supply: Expeditious movement of AMC MICAP, VVIP, and FSS items.* Scott Air Force Base, IL: HQ AMC/LGSWR.

-----. (2002a). Air Mobility Command Instruction 21-108. *Maintenance: Logistics support operation*s. Scott Air Force Base, IL: HQ AMC/LGMMP.

-----. (2002b). Web based computer software: *Global decision support system (WinGDSS).* Version 4.4A. Scott Air Force Base, IL: HQ AMC.

-----. (2003a). *Concept of operations for Air Mobility Command OCONUS en route aircraft maintenance capability*. Scott Air Force Base, IL: HQ AMC/LGM.

-----. (2003b). AMC Supplement 1 to AFI 21-201. *Maintenance: Aerospace equipment maintenance management.* Scott Air Force Base, IL: HQ AMC/LGMMP

-----. (2004). *AMC mission ID encode/decode tables.* Scott Air Force Base, IL: HQ AMC/A33C.

-----. (2005). Directorate of Logistics briefing for 18 February, 2005. *A4 slides summary: Aircraft status by mission, design, series*. Scott Air Force Base, IL: HQ AMC/A4. Retrieved 26 February, 2005, from https://amclg.scott.af.mil/lgslides/index.html

-----. (2006). Air Mobility Command Instruction 65-602. *Financial management: Transportation working capital fund (TWCF) budget guidance and procedures*. Scott Air Force Base, IL: HQ AMC/FMA.

Clavenna, J. A. (1996). *Air Mobility Command (AMC) vs. commercial air: Who provides the best delivery service?* MS thesis. School of Logistics and Acquisition Management, Air Force Institute of Technology (AU). Wright-Patterson Air Force Base, OH: AFIT/GTM/LAL/96S-3. Defense Technical Information Center designator: AAM 7332.

Department of the Air Force (DAF). (2004). Air Force Instruction 21-101. *Maintenance: Aerospace equipment maintenance management.* Washington: HQ USAF/ILM.

-----. (2005). Air Force Instruction 16-401(I). *Operations support: Designating and naming defense military aerospace vehicles.* Washington: HQ USAF/XPPE.

Ebeling, C. E. (1997). *An introduction to reliability and maintainability engineering*. New York: McGraw-Hill Companies Inc.

Eighteenth Air Force (18th AF). (2005). Scott Air Force Base, IL: HQ 18th Air Force. Retrieved September 20, 2006, from https://18af.amc.af.mil/About_18AF.cfm

Fifteenth Expeditionary Mobility Task Force. (2006). Travis Air Force Base, CA: 15th EMTF. Retrieved September 20, 2006, from https://15emtf.travis.af.mil/philosophy.html

Gillaspie, T. W. (1999). *Logistics factors affecting initial deployed aircraft sortie generation.* MS thesis. School of Logistics and Acquisition Management, Air Force Institute of Technology (AU). Wright-Patterson Air Force Base, OH: AFIT/GLM/LAL/99S-5. Defense Technical Information Center designator: ADB 248468.

Herbert, A. J. (2004). Checking Up on Old Aircraft. *Air Force Magazine, Journal of the Air Force Association, 87*(12): 32-37. Retrieved October 1, 2006, from http://www.afa.org/magazine/dec2004/1204aircraft.asp

Hester, I. R. (2001). *Analysis of the effect of centralizing management of mobility readiness spares package assets.* MS thesis. School of Systems and Logistics, Air Force Institute of Technology (AU). Wright-Patterson Air Force Base OH, AFIT/GLM/ENS/01M-12. Defense Technical Information Center designator: ADA 391232.

Hutcheson, K. A. (1999). *Air mobility: The evolution of global reach.* Vienna, VA: PointOne Publishing.

International Civil Aviation Organization (ICAO). (2006). *ICAO Document 7910: Location indicators.* (118th quarterly ed.). Montreal, Quebec: Secretary General, ICAO.

Killingsworth, P. S., Galway, L., Kamiya, E., Nichiporuk, B., Ramey, T., Tripp, R., & Wendt, J. (2000). *Flexbasing: Achieving global presence for expeditionary aerospace forces.* Santa Monica, CA: Rand Corporation. Document number: MR-1113-AF.

Leedy, P. D., & Ormrod, J. E. (2001). *Practical research: Planning and design* (7th ed.). Upper Saddle River, NJ: Merrill Prentice Hall.

Lynch, K.F., Drew, J. G., Tripp, R. S. & Roll, Jr., C. R. (2005). *Supporting expeditionary aerospace forces: Lessons from Operation Iraqi Freedom.* Santa Monica, CA: Rand Corporation. Document number: MG-193, 2005.

Martinez, S. L. ((2001). *The effect of improving the logistics pipeline on supply support of aerospace expeditionary forces.* MS thesis. School of Systems and Logistics, Air Force Institute of Technology (AU). Wright-Patterson Air Force Base, OH: AFIT/GLM/ENS/01M-16. Defense Technical Information Center designator: ADA 390983.

McClave, James T., Benson, P. G., & Sincich, T. (2001). *Statistics for business and economics* (8th ed.). Upper Saddle River, NJ: Prentice Hall.

Mehuron, T. A. (2005). USAF Almanac 2005: Equipment. *Air Force Magazine, Journal of the Air Force Association, 88*(5), 66-70. Retrieved October 1, 2006, from http://www.afa.org/magazine/May2005/0505structure.pdf

Microsoft Corporation. (2001). Computer software: *Microsoft® Excel 2002.* Redmond, WA: Microsoft Corporation. CD-ROM.

Office of the Assistant Secretary of Defense (Public Affairs). (2004). *Defenselink: Unified command plan.* Washington: OASD (PA), 2004. Retrieved October 5, 2006, from http://www.defenselink.mil/specials/unifiedcommand

Oliver, S. A., Johnson, A. W., White III, E. D., & Arostegui, M. A. (2001). Forecasting readiness. *Air Force Journal of Logistics*, *25*(3): 47-59.

Pyles, R. A. (1999). *Aging aircraft: Implications for programmed depot maintenance and engine-support costs.* Santa Monica, CA: Rand Corporation. CT-149, 1999.

Ramey, T. L. (1999). *Lean logistics: High-velocity logistics infrastructure and the C-5 Galaxy.* Santa Monica, CA: Rand Corporation. Document number: MR-581-AF.

Randall, C. E. (2004). *An analysis of the impact of base resources on the availability of Air Mobility Command aircraft.* MS thesis. School of Systems and Logistics, Air Force Institute of Technology (AU). Wright-Patterson Air Force Base, OH: AFIT/GLM/ENS/04M-16. Defense Technical Information Center designator: ADA 424191.

Rhodes, J. P. (2006). *USAF retires last Lockheed Martin C-141 Starlifter; World's first jet-powered airlifter completes 43-year career.* Wright-Patterson Air Force Base, OH: Lockheed Martin Corporation. Retrieved March 1, 2007, from http://www.lockheedmartin.com/wms/findPage.do?dsp=fec&ci=17637&rsbci=0&fti=111&ti=0&sc=400

Salmond, J. M. (2005). *Decision analysis method for air mobility beddown planning scenarios.* MS thesis. School of Systems and Logistics, Air Force Institute of Technology (AU). Wright-Patterson Air Force Base, OH: AFIT/GEM/ENS/05M-02. Defense Technical Information Center designator: ADA 434204.

SAS Institute. (2005). Computer software: $JMP_{6.0}$® *The statistical discovery software*. Version 6.0. Cary, NC: SAS Institute Inc. Air Force Institute of Technology licensed CD-ROM.

715th Air Mobility Operations Group (AMOG). (2003). *Transportation: Small terminal assistance program (STAP)*. 715 AMOG operating instruction 24-1. Hickam Air Force Base, HI: 715 AMOG/LGX.

721st Air Mobility Operations Group. (2003). *2003 721 AMOG fact book*. Ramstein Air Base, Germany: 721 AMOG/CCEA.

Smith, D. (2004). *The operational impact of mobility readiness spares package configuration during Operation Iraqi Freedom.* MS thesis. School of Systems and Logistics, Air Force Institute of Technology (AU). Wright-Patterson Air Force Base, OH: AFIT/GLM/ENS/04M-18. Defense Technical Information Center designator: ADA 423116.

Tanker/Airlift Control Center (TACC). (2005a). *TACC brochure.* Scott AFB IL: TACC/XON.

Tanker/Airlift Control Center (TACC). (2005b). TACC daily operation summary briefing for 18 February, 2005. Scott AFB IL: TACC. Retrieved March 11, 2005, from https://tacc.scott.af.mil/information/Ext_Reports/opssum/opssum.asp

Thompson, R. (2006). Busiest in DOD, Balad Air Base sets new record*.* *Air Force in Iraq*. Balad Air Base, Iraq: 332nd Expeditionary Air Wing. Retrieved September 18, 2006, from http://www.balad.afnews.af.mil/news/story.asp?story ID=123021582

Tripp, R.S., Lynch, K. F., Drew, J. G., & Chan, E. W. (2004). *Supporting expeditionary aerospace forces: Lessons from Operation Enduring Freedom.* Santa Monica, CA: Rand Corporation. Document number: MR-1819-AF.

Tripp, R.S., Galway, L., Ramey, T. L., Amouzegar, M., & Peltz, E. (2000). *Supporting expeditionary aerospace forces: A concept for evolving the agile combat support / mobility system of the future.* Santa Monica, CA: Rand Corporation. Document number: MR-1179-AF.

United States Joint Forces Command (USJFCOM). (2000). Joint Publication 4-01.4. *Joint tactics, techniques, and procedures for joint theater distribution.* Suffolk, VA: Joint Warfighting Center.

-----. (2003). Joint Publication 4-01. *Joint doctrine for the defense transportation system.* Suffolk, VA: Joint Warfighting Center.

-----. (2002). Joint Publication 3-17. *Joint tactics, techniques, and procedures for air mobility operations.* Suffolk, VA: Joint Warfighting Center. Incorporates change 1, 14 August 2006.

Wall, D. B. (2004). *Theoretical models for aircraft availability: Classical approach to identification of trends, seasonality, and system constraints in the development of realized models.* MS thesis. School of Systems and Logistics, Air Force Institute of Technology (AU). Wright-Patterson Air Force Base, OH: AFIT/GLM/ENS/ 04M-20. Defense Technical Information Center designator: ADA 423009.

Young, S. (2005). USAF Almanac 2005: Gallery of USAF weapons. *Air Force Magazine, Journal of the Air Force Association, 88*(5), 146-169. Retrieved October 1, 2006, from http://www.afa.org/magazine/May2005/0505weapons.pdf

Vita

Senior Master Sergeant Robert D. Polomsky graduated from Rootstown High School in Rootstown, Ohio, in 1981. He entered the Air Force in 1983 and was selected as a Basic Training Honor Graduate. He received his Bachelor of Science in Professional Aeronautics from Embry-Riddle Aeronautical University, Daytona Beach, Florida.

His first assignment in December 1983 was to the 380th Bombardment Wing (SAC), Plattsburgh AFB, New York as a KC-135 crew chief, trainer/certifier, and Field Training Instructor. In June 1994, he served as an active duty advisor to the 107th Air Refueling Wing (ANG), Niagara Falls, New York where he provided technical assistance during the wing's conversion from F-16 to KC-135R aircraft. Next, he was assigned to Air Mobility Command Headquarters, Scott AFB, Illinois in September 1996 where he served in the Tanker Airlift Control Center (AMC/LGRC) as a Senior Logistics Controller. In March 2000, he was assigned to Headquarters 21st Air Force, McGuire AFB (AMC), New Jersey as the KC-10/KC-135 Weapon System Manager. In 2002, he deployed for two separate 100-day tours as the Executive Noncommissioned Officer to USCENTCOM Director of Mobility Forces coordinating daily mobility taskings in support of Operation ENDURING FREEDOM. In April 2003, he served as liaison for the U.S. forces deployed to Romania in support of Operation IRAQI FREEDOM.

In September 2003, Sergeant Polomsky was selected to attend the Air Force Institute of Technology's Information Resource Management Program. Upon graduation, he will be assigned to Plans, Programs, Requirements, and Assessments Directorate of Air Force Special Operations Command Headquarters (AFSOC/A5), Hurlburt Field, Florida.

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14. ABSTRACT

The ability of the United States Armed Forces to maintain a global presence and rapidly project military power anywhere in the world are key factors in preserving our freedom. To accomplish the demanding task of global reach support, Air Mobility Command employs an en route support infrastructure. These en route locations provide varying levels of command, control, and communications (C^3), logistics support, and aerial port functions. The goal of the en route is to minimize delays for AMC mission aircraft. However, these en route locations comprise a small percentage of the locations that AMC aircraft visit. Given the critical demand for rapid air mobility, potential impact of mission delays or cancellations, and the substantial investment of taxpayer dollars, AMC must provide logistical support to off-station aircraft in the most effective manner possible.

This research examined a 5-year historical summary of AMC's logistical support process. The resulting data was used to perform a statistical analysis of AMC off-station aircraft logistic support records for AMC's six primary aircraft fleets (C-5, C-17, C-141, C-130, KC-10, & KC-135). The calculated average not mission capable (NMC) time was used to compare overseas en route and non en route locations to assess AMC's en route infrastructure's effectiveness in reducing mission delays due to aircraft maintenance problems. Effectiveness, in the context of this research, was measured in terms of a lower or shorter average NMC time, equating to reduced mission delays.

The initial data analysis on OCONUS en route and non en route locations provided a macro level assessment based on location only. A closer investigation on each of the six primary AMC aircraft fleets returned varying results in terms of reduced averaged NMC time. To determine if a significant difference existed between data groups, parametric and nonparametric statistical testing methods were used. All data groups were tested for normal distributions using histograms and goodness-of-fit tests. Each of the data set had non-normal or non-lognormal distribution and unequal variances based on F-test results. Mann-Whitney (Wilcoxon) tests were used to determine significant differences between the ranked sums and unpaired two-sample Student's t-tests assuming unequal variances were also applied to test for differences in population means.

The results of this study indicate that the OCONUS en route infrastructure is effective in reducing average NMC time as compared to OCONUS non en route locations, except in the case of the KC-135 fleet. Overall, en route locations appear to reduce average NMC time by more than 17 hours. Results of the aircraft fleet comparisons reveal significant reductions in NMC time for the C-5, C-17, C-141, and KC-10 fleets. The C-130 fleet appeared to achieve a slight reduction in average NMC time. In the case of the KC-135, the en route average NMC time was nearly one hour higher than non en route locations. The findings of this study could be further evaluated by the suggested future research topics.

15. SUBJECT TERMS

Logistical Support, Aircraft Maintenance, Air Mobility Command (AMC), Tanker/Airlift Control Center (TACC), Logistics Readiness Center (LRC), AMC En Route Support.

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